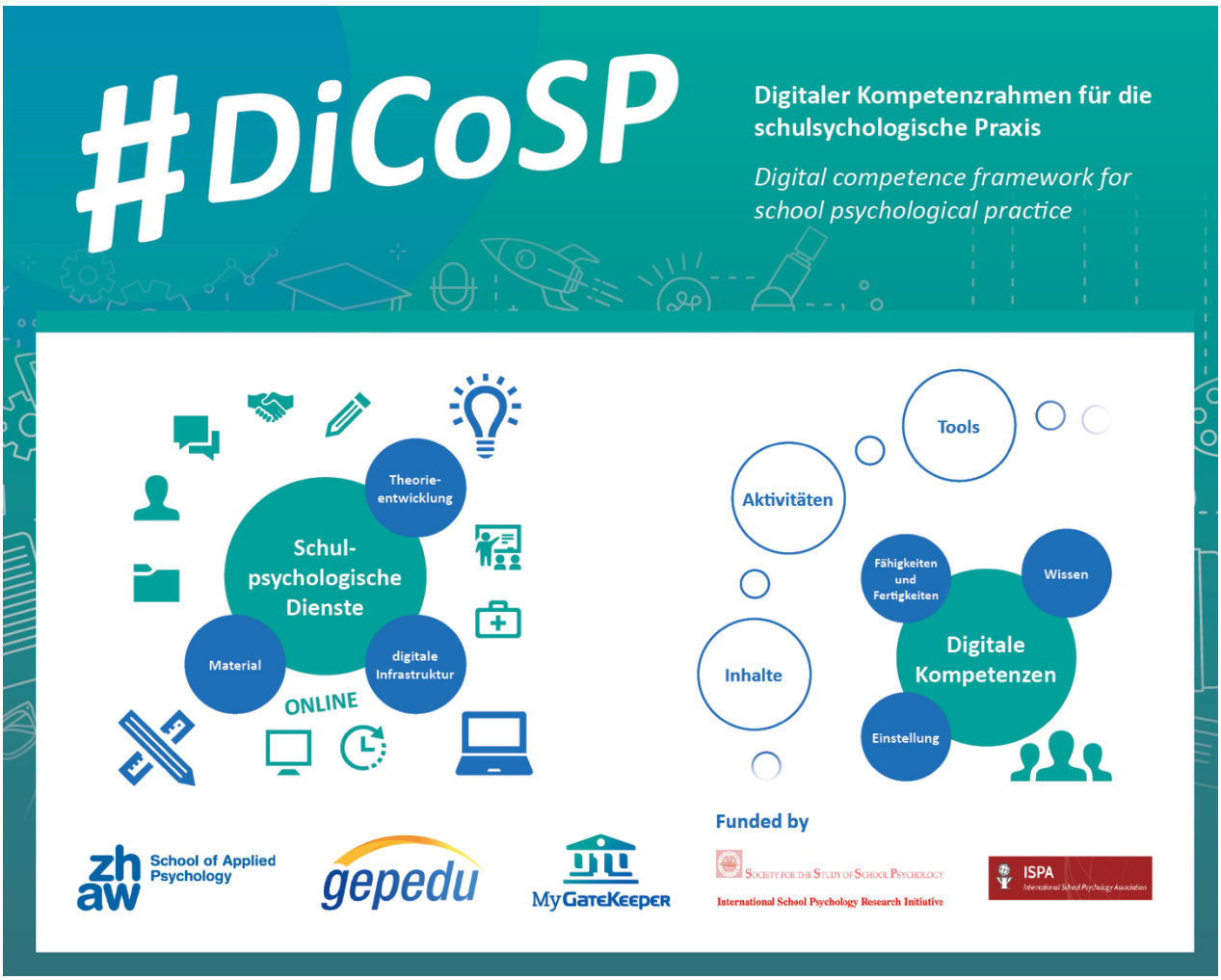
Digital Competence Framework for School Psychological Practice DiCoSP



RESEARCH REPORT
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Coordination
M. Kant-Schaps, non-profit corporation MyGateKeeper
Prof. Dr. Ch. Steinebach, ZHAW Angewandte Psychologie

Abstract

The study "Digital Competence Framework for School Psychology Practice" (DiCoSP) aimed at developing a comprehensive, needs-based structure of professional requirements for school psychologists (SP) due to the digital transformation (DT) in Austria (AT), Belgium (BE), Germany (DE) and Switzerland (CH). No such framework existed before. A systematic literature review, expert focus groups, an online questionnaire (N=282) and online assessment of digital competence (DC) enabled the development of the DiCoSP model consisting of a

- definition of DC in the practice of school psychology
- architectural DC model
- DC matrix across the SP's professional activity spectrum.

While most SPs estimated to have good prerequisites for coping with DT, half of them were uncertain about the professional significance of DK and DT. This was expressed in a discrepancy between high appreciation of DC and lower rated own DC, especially in digital related knowledge (e. g. knowledge of copyrights) and methodological/media competence. Digital technology was hardly used for an interactive creation of digital spaces (e. g. networking in Communities of Practice). The usage was mainly limited to classical applications of information and communication, especially in administration, communication with target persons, collegial cooperation, and counseling. DC seemed to be least relevant in intervention.

DC is a necessary, but not a sufficient condition for SP’s remote work. Important prerequisites are also the conviction of added value, the quality of digital infrastructure at work (specialized software, connectivity, digitally competent organization, protection under labor law) and clear professional guidelines (e.g. legal-ethical professional standards, a vision of digitally related work in school psychology).

Table of content

1. INTRODUCTION

Technological innovation and globalization have led to increased complexity and constant change in labor market requirements in the economy and society, with occupational profiles disappearing or becoming more differentiated (e.g. cyberpsychology, media psychology, media pedagogy) and occupational requirements no longer being predictable. This dynamic requires a lifelong updating of professional competence so that people will. be able to adapt flexibly to social and professional demands. It also affects - accelerated by the Covid 19 pandemic - the promotion of digital competence (DC) of school psychologists (SP).

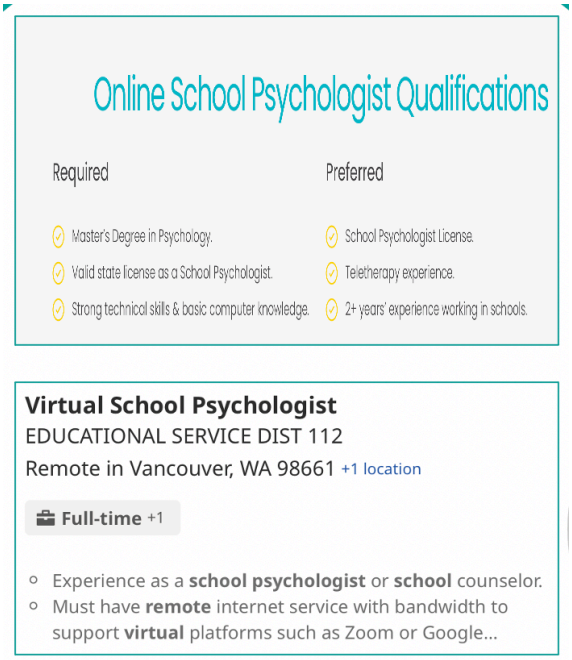


FIGURE 1 *Job offers at indeed.com*

Promoting DC is high on the European policy agenda with the aim of increasing the percentage of the EU population (aged 16-74) with at least basic DC from 56% in 2019 to at least 70% by 2025, and of adult (aged 25-64) participation in education within the last 12 months from 38% in 2016 to 50% by 2025 (EUROPEAN COMMISSION 2020c).

The DC acquisition by SPs also fits into this political context. Despite the great importance of digitalization for the practice of school psychology, there has not yet been a comprehensive framework for DC of SP. The research study "**Di**gital **Co**mpetence Framework for **S**chool Psychology **P**ractice" (acronym = DiCoSP) intended to fill this gap to strengthen the importance and quality of school psychological services in the digital age. A reference framework can help to structure heterogeneous aspects of school psychology regarding an environment in digital transformation (DT). It can function as a compass for professional qualification, practice, education, and training of SPs.

Based on the European Digital Competence Framework (DigCom) (CARRETERO GOMEZ, VUORIKARI, PUNIE 2017) and the existing professional competence frameworks for SP in German-speaking regions of AT, BE, DE, and CH, DiCoSP intended to

- identify the professional needs of digital-related competences of SPs in practice with the help of a comprehensive literature review and an empirical study;

- identify SP's training needs related to DC;
- develop a digital competence framework for the practice of school psychology.

The study was funded by the 2020/2021 Grant Award of the International Initiatives Committee of the Society for the Study of School Psychology (SSSP) and the International School Psychology Association (ISPA) with a project duration from March 1, 2021 to February 28, 2023. It was coordinated by MyGatekeeper, a German non-profit company supporting DT in education, under the leadership of SP M. Kant-Schaps, and Prof. Dr. Ch. Steinebach, Director of the Department of Applied Psychology, and the Institute of Applied Psychology at the Zurich University of Applied Sciences (ZHAW).

1.1. EXCURSUS: CLARIFICATION OF THE TERM "COMPETENCE" FOR GERMAN-ENGLISH TRANSLATION

The concept of 'competence' causes both intra- and interlinguistic problems (BROCKMANN, CLARKE, WINCH 2009). In German, there is no distinction between 'competence' and 'literacy' as in English: both terms are translated as "competence".

MARTIN's (2006a) definition of 'digital literacy' is very close to the definition of 'digital competence' used in DiCoSP, as it is understood in terms of a person's ability to self-organize in digitally related situations.

*"**Digital literacy** is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process."* (MARTIN 2006 a., p.155)

MARTIN (2008) defines the English term of '**digital competence**' as *"... a requirement for and a precursor of digital literacy consisting of skills, concepts, approaches, attitudes...".* (MARTIN 2008, p.*167)*

In German, the required set of skills, knowledge, attitudes as a basis of "digital competence" is not summarized in a separate term.
MARTIN's (2006b) understanding of 'digital literacy' complicates the linguistic translation, as "competence" and "performance" are intertwined:

"In moving from digital competence to digital literacy, however, we take on board the importance of situational embedding. Digital literacy must involve the successful usage of digital competence within life situations, the appropriate application of digital competence within specific professional or domain contexts, giving rise to a corpus of

digital usages specific to an individual, group or organization… In the case of digital usages, users draw upon relevant digital competences and elements specific to the profession, domain or other life-context." (MARTIN 2006b, p.*256)*

In German, the term 'digital literacy' is more in line with the term "digitale Performanz" (digital performance) as the result of applying DC as a self-organizing ability based on the set of knowledge, skills, attitudes as well as personality traits and specific situational competences in a digital-related situation.

Whereas in English, according to MARTIN (2006b), the term 'digital literacy' implies a qualification as successful application of 'digital competence', in the German translation the term ‘competence’ is independent of the success of an action due to the following understanding:
'Competence' is a psychological construct that is not directly observable and measurable. Competence is always linked to an action because the existence of competence can only be inferred from the observation of an action. If a person has sufficient digital competence to be capable of acting in a specific situation, but perhaps does not act on that competence for ethical reasons, an observer may consider the acting person to be 'incompetent' even though he/she is competent. The motivational, volitional aspect of the competence concept is an important feature of the definition of ‘competence’ and makes the concept independent of the assessment of a situation as 'successful'. In German, the term 'Kompetenz' carries only the potential of being able to act successfully in situations.

In this study, the terms are understood and translated as follows:

- The DiCoSP study uses the term 'digital competence' for two reasons: The term 'digital literacy' is more commonly used in Europe when referring to the social dimension of digitalization, while the term 'digital competence' is used in the sense of a comprehensive educational concept. The term 'competence' is based on intertwined knowledge, skills and attitudes based on the taxonomies developed by BLOOM (1956) and KRATHWOHL (2002). The use of the term 'competence' rather than 'literacy' thus brings into focus a broader conception of education and its constituent elements, which is advantageous for achieving the study objectives. The DiCoSP competence framework is not about measuring competence, but primarily about a conceptual function.
- The German 'Digitale Kompetenz’ is translated into English as 'digital competence' and is used like the term 'digital literacy' in the sense of MARTIN (2006a) as the ability to self-organize with the aim of being able to act without judging behavior as 'successful'.
- The German 'Digitale Performanz’ is translated as 'digital usage' or 'digital performance’.

- The basics of digital-related competence types (professional competence, methodological competence, social competence, personal competence = ' FMSS ' in German and 'PMSP' in English), namely digital knowledge, skills, and attitudes (= 'KAS'), are collectively translated as 'digital competences'.

2. DIGITAL COMPETENCE AS AN AGENT OF DIGITAL TRANSFORMATION IN SCHOOL PSYCHOLOGY

In 2006, the National Association of SPs in the USA (NASP) included "technology" as a specific area in their blueprint for training and practice in school psychology. YSSELDYKE (2007a) saw increasing digital technology as one of the biggest influences on the role of the SP. Although DC of SP is considered important, to date there has been no comprehensive approach to the DC of practicing SP that could summarize the heterogeneous issues of DT into a structured overview.

Recent findings show that the level of knowledge about a digital-related way of working in school psychology is relatively low and has not yet been extensively established in practice (HENNIGAN 2019, SONG et al. 2020, VON HAGEN et al. 2021, REUPERT 2021, SCHULPSYCHOLOGISCHER DIENST PFÄFFIKON CH 2020, BUNDESMINISTERIUM FÜR BILDUNG, WISSENSCHAFT UND FORSCHUNG ÖSTERREICH 2020). Even in 2021, KING, BLOOMFIELD, WU & FISCHER (2021) found that despite growing publications on the use of online school-based counseling, the overall status of this service is still unknown. The extent of adaptation to the circumstances of the pandemic suggests that SPs have not yet taken it for granted to work with the help of digital resources. FARMER et al. (2021) and the 2020 annual report of the Pfäffikon/CH school psychology service ('Jahresbericht 2020 des Schulpsychologischen Dienstes Pfäffikon/CH') bear witness to this:

"*Even if SPs have access to test materials and the necessary technology to conduct assessments over the internet, they may not have the training and clinical experience to engage in telehealth competently … It is not presently clear which school psychology training programs ... cover telehealth in their training curriculum*." (FARMER et al. 2021, p.29)

"*Across the board, the pandemic containment regulations, especially the school lockdown ... put us under immediate digital adaptation pressure. Fortunately ... at the time of the initial lockdown, the SPS' team was able to immediately access a Citrix remote environment to externally retrieve and process all case-related information ... Nevertheless, it was a new territory for us psychologists to conduct clarification interviews with parents and teachers "online" ... More elaborate counseling-therapeutic interventions and methods, such as the inclusion of spatial conditions and physical*

experiences (e.g., in a structural constellation) on a screen are only possible with difficulty." (SCHULPSYCHOLOGISCHER DIENST PFÄFFIKON 2020, p.10, free translation)

NASP (2020a) stated, that there was a great deal of uncertainty and concern among SPs about how virtual services should be conducted in pandemic circumstances.

In German-speaking countries in Europe there have been no national legal provisions for DC and a digital-related way of working in the professional activity profile of the SP so far (APPENDIX 6). SP's DC seemed to play a minor role as a topic of the profession in German-speaking countries compared to other countries (EFPA 2020a).

The DiCoSP study assumed that the discrepancy between the importance of DC and the use of digital resources in school psychology was related to a lack of knowledge about DC, a lack of needs-based education and training opportunities, and the lack of a holistic view of DT in school psychology. These gaps should be analyzed to qualify SP for services in an increasingly digitalized society.

In the countries studied, no coherent concept of the development of SP's DC in the context of education and training could be identified, although a specific professional profile is considered necessary due to the context-dependency of professional competence (ROE 2002). A study on DC of psychology students as "digital natives" concluded that it is worthwhile to promote DC of psychologists by including DC in educational curricula of universities and psychological societies (BERMÚDEZ OCHOA, OSPINA MOSQUERA 2016). In German-speaking European countries, higher education and adult education is still struggling to develop competence-based curricula since the introduction of the European Qualifications Framework for Lifelong Learning (EFQ) (COUNCIL OF THE EUROPEAN UNION 2008).

In 2018, the German Science Council critically assessed DT in the field of psychology and encouraged the psychological discipline to become more active in regard to DT: *"... the Science Council observes that psychology takes up every day phenomena only late - for example, effects of a more or less extensive use of digital technologies on social behavior and experience - and rather hesitantly makes them a subject of its research… Psychology as a science offers theories and findings, methods as well as solution approaches for various fields of action ... They cannot be solved technically alone, but behavioral science approaches are also needed*." (DEUTSCHER WISSENSCHAFTSRAT 2018, p.82/83, free translation).

It was since January 2022 that the Division of Educational Psychology of the German Society for Psychology has established a Twitter account https://twitter.com/DGPs_PaedPsych/status/1520298929778311168 to make contributions to research, teaching, and practice more visible.

A recent study of the state-funded "Higher Education Forum on Digitization (Hochschulforum Digitalisierung)" as a central player for

digitization topics in the field of higher education, concluded that the curricular development of DC of students in the various disciplines is still in its infancy at German universities (GRÜNEWALD 2020). In view of the hesitant digital change, there was a great need for further training and certification of DC among all university members, so that institutes of higher education have an obligation to meet this need by training offers.

In adult trainings, ROHS and BOLTEN (2020) pointed out this concern: *"So far, however, there is hardly any orientation regarding the relevant media pedagogical competences that are necessary in adult education. The (broader) anchoring of corresponding competence descriptions in the core curricula of adult education as well as sectoral competence models would therefore be of great importance."* (ROHS & BOLTEN, p.86, free translation)

Competence research claimed further need for knowledge gain. According to ERPENBECK & VON ROSENSTIEL (2007b), the conditions of DT with the 'VUCA characteristics' of volatility, uncertainty, complexity, and ambiguity (STOCKER 2021, BENNET & LEMOINE 2014) required a new culture of self-organized learning. The most important result was seen in the production of 'competences'. VON ROSENSTIEL (2001) concluded based on his intensive involvement with competence measurement in the context of research in industrial/ psychology: organizational

"Competence acquisition is a research field that has hardly been explored. Research is needed here to clarify the interrelationships. What conditions at the workplace or within the team, what stimuli and challenges in the social environment, what methods and content within formalized training, what offerings within electronic networks lead to the successful development of competence, and what effect do these competences have?" (Von ROSENSTIEL 2001, p.34, free translation)

The DiCoSP study contributed to this need by developing a definition of competence in school psychology practice and by analyzing the relationship between employment conditions and SP's professional DC.

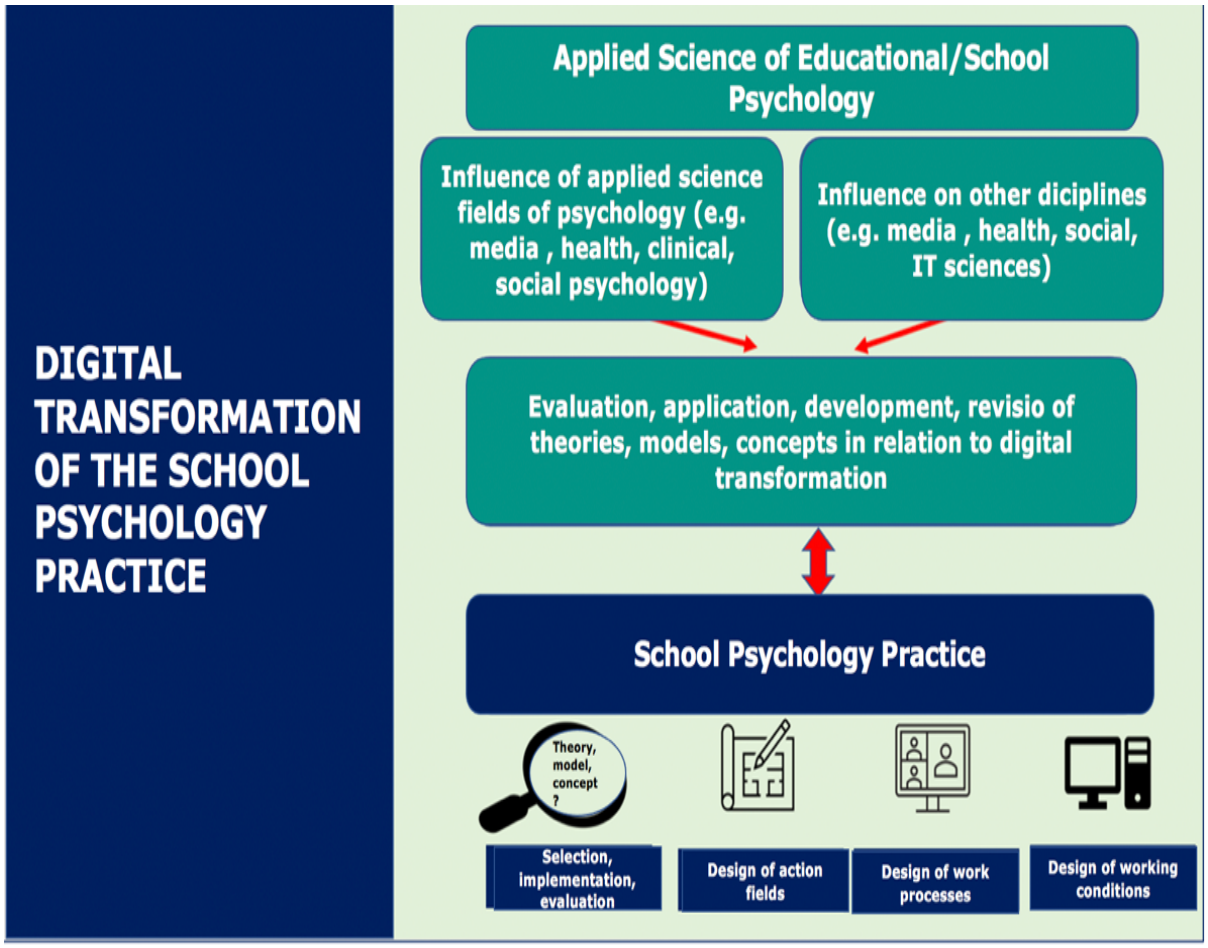
DiCoSP assumed that an overview of SP's DC in their professional practice can facilitate the creation of a needs-based educational plan. Therefore, this study aimed to

- clarify to what extent competence models are available in education and training or at workplaces of SP in AT, BE, CH, and DE as a basis for the acquisition of DC,
- analyze the need for DC on the one hand and the offers of competence acquisition by a systematic literature review and by questioning SP in the German speaking countries AT, BE, CH, and DE,

- help fill the gap of a holistic view of DT by developing a needs-based digital competence framework for school psychology practice.

How does the SP's DC relate to the DT in school psychology? Educational psychology and school psychology as an applied science have always been oriented towards practice and evolved with practice (BDP 2015). Therefore, School Psychology is required to deal with DT. Figure 2 visualizes processes of digital-related transformation in school psychology.

FIGURE 2 *DT in school psychology - own illustration based on METZ/SPIES (2020)*



While influences from diverse fields of applied psychology and disciplines give their input on topics of DT, it is a task on a scientific level to develop or adapt theories, models, concepts, and applications in the context of digital change. At the practical level of school psychology, the task is to find answers to the following questions:

- How important is DT for professional practice?

- Which opportunities and risks does remote work offer for SP (fields of tasks and action, work processes and conditions)?
- How important are the effects of DT in society for the practice and professional role of SP, especially in view of possible applications of Artificial Intelligence and Big Data (HARLOW & OSWALD 2016, KLEEBERG-NIEHAGE 2020)?
- How can SP have a formative influence on DT (adaptation of digital-related theories, models, concepts, of work processes, professional profiles, of organizations), e.g. counseling teachers on methods and didactics of e-learning (DRUMMMER et al. 2011)?
- When, how and why DC is promoted in education and training.

VON ROSENSTIEL (2001) provided a remarkable rationale why it is important to engage scientifically with DC in school psychology:

"While decades of research have produced relatively secure knowledge on the acquisition of qualifications - especially in the fields of psychology and pedagogy - such a scientifically based body of knowledge is still largely lacking in the new and increasingly important field of competence acquisition. What favors self-organized and self-responsible acquisition of competences? There is a lot to be said for the fact that this happens on the one hand, in the goal-oriented handling of complex problems in the real confrontation with the world and that contextual conditions are required for this that promote such a confrontation... Also significant in this context, however, are visibly lived values in the environment of the individual... It is therefore the culture, in this case specifically a learning culture related to the development of competences, that drives the joint development of competences. It is about the individual, but also and essentially about the group and the entire organization." (VON ROSENSTIEL 2001, p.32, free translation)

According to ERPENBECK and VON ROSENSTIEL (2007b), DT requires not only a common competence to cope with the challenges, but also a new learning culture. They share the idea of cultural change with several other researchers.

ROTH (1968) is often mentioned as one of the first to introduce the concept of competence in educational science in the German-speaking world with his work *'Pedagogical Anthropology'.* He expressed the opinion that man's ability to learn can develop a productive creative power as a basis of cultural development (ROTH 1971, p.205). His idea was taken up by LANGEMEYER (2005):

"Learning, in such a comprehensive sense, can be understood not only as the acquisition of cognitive structures and behaviors, but also potentially as a productive change in practice, in the means and methods of work, and can be linked to both internal (psychological, cognitive) and external (social, cultural, societal) development." (LANGEMEYER 2005, p.13, free translation)

In this respect, the acquisition of DC in school psychology practice means at the same time a cultural change of school psychology work culture. The DiCoSP - study followed the model of MARTIN (2008), who classified DC as an **agent of cultural change in school psychology** (Figure 3). In his view, the application of DC in practice creates a digital usage profile that is specific to an individual, a team, a department, an organization. In using digital resources, SPs draw on competences and elements specific to their profession, personal history, and professional development. DC and usage of digital resources in school psychology practice are specific to the profession and situation because it relates to solving professional problems, completing a task, or achieving a goal within the professional context. According to MARTIN, the development of a digital usage profile reaches the stage of DT when it has brought about significant innovative and creative changes, individually, as a team, a professional group, a science, as an organization in which SPs are educated, trained, work or are represented. This process is reciprocal.

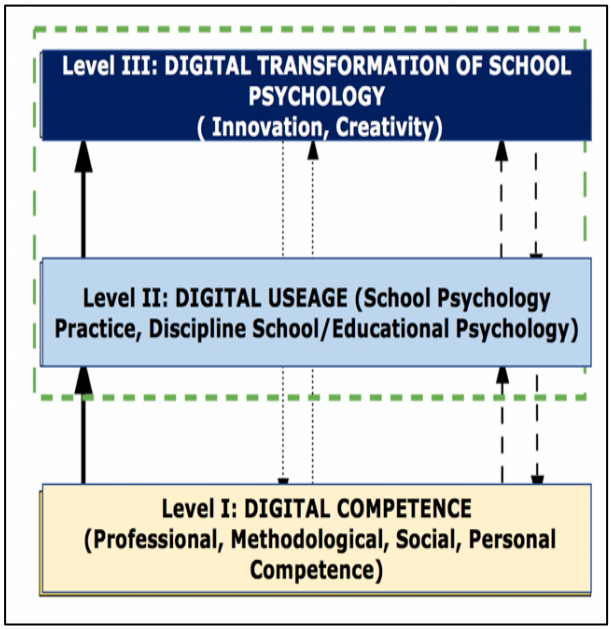


FIGURE 3 *Own illustration based on MARTIN (2008, p.167)*

MARTIN (2008) concluded *"Thus, for individuals to view themselves as developing digital literacy and to reflect on the implications of that for their identity and their life plays a part in helping to build socio-cultural patterns which give people some understanding and sense of control in an unstable age."* (MARTIN 2008, p. 174)

DT is having an impact on the work culture of school psychology through the fundamental importance of the shift in time and space (CASTELLS 2002/3). More autonomy and flexibility in time changes the work-life balance blurring the boundaries between private and working life. Remote work allows for the avoidance of commuting times and facilitates professional contacts. This is especially beneficial for the work with schools in remote areas or for professional contacts world-wide. Webinars organized by the International School Psychologists Association (ISPA) are a good example. Remote work often results in increased productivity and engagement, but also bears the risk of increased perceived stress (BREISIG et al. 2019, SANDOVAL-REYES et al. 2021, EUROFUND 2022).

SPs are also affected by DT in that physical spaces are no longer strictly necessary for learning. DT makes it easier to share information via websites, social media, and mobile apps. Depending on personal needs,

digital learning can in principle be carried out anywhere at any time. Digital learning loosens the boundaries of formal and informal learning and increases participation and exchange. This bottom-up approach is changing the historically established hierarchies of education and training. Participants in self-organized virtual "Communities of Practice" for example, come together to exchange topic-related information and experiences and to receive feedback from each other (LAVE & WENGER 1991, WENGER 2005). The flexibility provided by digitization facilitates the learning of practitioners, whose time for training is limited by a wide range of tasks (BRIEN & HAMBURG 2014) and restricted working conditions.

BAETHGE & OBERBECK (1986) came up with the term "systemic rationalization" while searching for a qualification concept in a digitized work environment. For them, the use of information and communication technology (ICT) involves besides technical aspects also a change in work culture: "...*the operational and inter-operational flow of information, the communication about and combination of data, the organization of operational processes and the control of the different functional areas in an administration or in a company must be redesigned in one go.*" (BAETHGE & OBERBECK 1986, p.21, free translation)

This means that the usual handling of work material and the usual communication behavior with clients and colleagues needs to be changed, whereby responsiveness, the ability to abstract, the ability to concentrate and accuracy are required. The importance of experiential knowledge is thereby diminished. From this point of view, the use of ICT causes an indeterminacy of decision-making situations and an openness of interaction situations, so that for BAETHGE & OBERBECK the most important professional requirement was the mastery of these situations by the development of key competences.

BELLIGER (2019) has analyzed the digital change in healthcare and education. She pointed out that DT is, at its core, not a technological but a cultural transformation process. This implies that DT is not primarily an information and communication technology (ICT) task, but a management task in education. This involves rethinking roles and competences, opening organizational and subject boundaries, intra- and interorganizational networking, and a new mindset. An example of this cultural shift is the website *https://washabich.de/.* Patients can have incomprehensible medical reports translated for free into easy language by medical students. This tool was changing the patient - professional relationship by challenging health professionals to communicate at eye level.

The joint 'Dagstuhl Declaration' (2016) of media education and computer science professionals on digital education underpinned this holistic approach:

"Education in the digital networked world must be viewed from a technological, socio-cultural and application-related perspective... In addition, it is the task of all subjects to integrate subject-specific references to digital education." (GESELLSCHAFT FÜR INFORMATIK 2016, p.1, free translation)

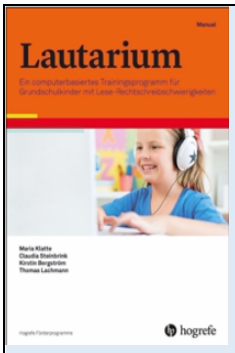
DC is thus a key to opening the door to the digital world for school psychology, whereby this is a multi-stage individual and communal development in the form of an assimilation and accommodation process in PIAGET's sense (PIAGET 1958). DC is thereby individually acquired informally or formally throughout life. It was classified in European policy as a transversal key competence of lifelong learning in the rank of a cultural technique like reading, writing, arithmetic (RAT DER EU/ COUNCIL OF THE EU 2018, p.189/9).

This holistic approach meant for the development of a digital competence framework for school psychology practice that a focus on only technical aspects was not sufficient. A holistic view of DC for SP in practice needed to include

- ethical, professional, social, and personal aspects of DT;
- the necessary professional knowledge, attitudes, and skills for a self-organized, creative, and critical use of digital technology for professional purposes;
- methodological-technological know-how, e.g. how chat bots can be designed for psychological counseling (ROMERO J. CASADEVANTE C., MANTORO H. 2020);
- an insight into the development of professional activity fields, profiles, and work processes under digital conditions,
- an insight into the necessary transfer between science and practice regarding DT (DE LA FUENTE, KAUFFMAN, DÍAZ-ORUETA 2018; FISCHER, KOLLAR, STEGMANN, WECKER 2013);
- an insight into the development of a digitally competent organization as a prerequisite for the implementation of DC, e.g. digital infrastructure, learning culture, multi-professional and interdisciplinary cooperation to solve professional challenges using digital technology (MEZGER &TEIBER & OTT & MEYER 2000).

What was the state of this cultural change in school psychology in AT, BE, CH, and DE?

DT started in European (school) psychology many years ago. The Internet is used for the entire spectrum of psychological interventions, from assessments to psychoeducation, self-help to online counseling and therapy (METZ & SPIES 2020, EICHENBERG & KÜHNE 2014). The following are examples of digitally related school psychology practice:



Application of digital tools for learning support with the help of SP, e.g. "Lautarium", a computer program supporting primary school children with reading and spelling difficulties.
https://www.lautarium.de and
http://www.esf-koordinierung.de/content/1-home/broschuere-esf.pdf

Here you find information on school psychological releant topics

Cybermobbing (PDF, 330 KB)
Cybermobbing in class? Tips for teachers (PDF, 546 KB)
Excessive media usage (PDF, 343 KB)

Information offered by school psychological services in PDF format for the public on digital issues (cyberbullying, media addiction)
https://www.nuernberg.de/internet/paedagogisches_institut/spinfo.html

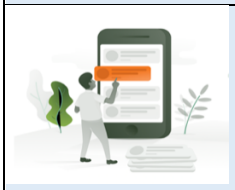
In-service training for teachers through video tutorials.

https://schulpsychologie.nrw.de/schule-und-corona/lehrkraefte/tutorial/index.html

Presentation of school psychological work via You-Tube videos, as in this video by an Austrian SP on cyberbullying prevention,
https://www.youtube.com/watch?v=pW3SFos1Df4

or via podcasts by SP for SP, e.g. "Vorübergehend geschlossen!" with tips on how work can succeed at the time of the Corona pandemic.

https://lv-schulpsychologie-nrw.de/podcast-schulpsychologie-in-zeiten-von-corona/



Chatroom - Offers for student couseling

https://www.euroguidance.eu/guidance-systems-and-practice/good-practices/clb-chat-pupil-guidance-centers-chat-service
and https://www.clbchat.be

Presentation of school psychological services via You-Tube video, here of the department against domestic violence of the School Psychological Service of the Swiss Canton of Aargau.

https://www.youtube.com/watch?v=pnBx1CP9T_k

School psychology explanatory video as part of psychoeducation – e.g. this lecture for students on "What does stress do to your brain?"

https://www.youtube.com/watch?v=tX6SZPioo6k&t=6s

The website, Facebook - and Instagram page "Young Kaleido" , of the Center for Healthy Development of Children and Adolescents in the German-speaking Community of Belgium (DG) 'Kaleido-East Belgium', where most of the SP of the German-speaking Community of Belgium work.
https://www.kaleido-ostbelgien.be
https://www.instagram.com/young_kaleido/?hl=
https://www.facebook.com/kaleido.dg/?ref=ts&fref=ts.

The creation of a psychologist chatbot that can help save a lot of time as a virtual psychological assessment assistant, e.g. during anamnesis interviews.
(ROMERO, CASADEVANTE, MONTORO 2020)

Development of digital tools for health promotion in schools by SP, e.g. the APP "Reset" for stress management of adolescents.

https://link.springer.com/content/pdf/10.1007/s11553-022-00952-2.pdf

Digital change particularly affected living and working environments of SP's most important target groups: children and young people, families, teachers, and educational institutions. The educational system has the task of teaching relevant digital skills, while at the same time both teaching and learning, educational content, and the monopoly position of classical educational institutions themselves are changing. This transformation brought about new challenges and perspectives for a range of activities of school psychology (TYSINGER, DIAMANDUROS, KENNEDY 2013). The study of VUORIKARI et al. (2020) demonstrated how parents were coping with school lockdowns during the Covid 19 pandemic and which significant role SP were expected to play in supporting children and families during distance learning. Approximately 40% of parents in AT, CH, and DE desired remote psychological support.

School psychology can support and shape the process of digital change in education, e.g. by developing, selecting, implementing, and evaluating digital learning theories and models (e.g. theory of multimedia learning (MAYER 2009), cognitive-affective-social theory of learning in digital environments (SCHNEIDER et al. 2022). In this sense, M. AVCI-WERNING emphasized in her laudation 2021 for the 100th birthday of school psychology in Germany:

"It will inevitably have to be about how people find a balance in the digital world in order to perceive themselves as competent in it...Since digitization will almost certainly change our lives faster than we can yet imagine, good concepts must be developed and implemented promptly in schools in cooperation with school psychology." (AVCI-WERNING 2022, p.7, free translation)

The scientific community took this concern into account to a certain degree: *"An ... example is the research on computer-supported collaborative learning, which builds on cognitive and social psychological findings and models, but has developed independent theories of its subject area on this basis... With the psychological foundations of education and upbringing, educational psychology researches a content area that per se has extraordinary social relevance, and in doing so also devotes itself to current social issues, such as the constructive shaping of digitization in education*." (RICHTER et al. 2019, p.110, free translation)

However, to date, there was little in-depth knowledge about SP's digital-based work in the context of school-based prevention and intervention.

*"Many school counsellors use technology for communicating with pupils for administration purposes (Glasheen & Campbell, 2009; Glasheen et al., 2014), but this group does not seem to be implementing it in their therapeutic work with pupils (Glasheen et al., 2013; Glasheen et al., 2015; Hennigan & Goss, 2016). This is surprising as young people use technology regularly for communication and social relationships (Mesch, 2012), and there is growing evidence that they would be open to using technology for mental health support if it were available..." (*HENNIGAN, J. 2018, p.61)

DT in school psychology should not only be functionally effective and efficient but should also contribute to developmentally friendly and

meaningful living conditions of target groups. School psychology can make an important contribution to achieve this goal, by considering cognitive, emotional, motivational, and health-related aspects of technology (DIEFENBACH, HASSENZAHL 2017). School psychology expertise plays an important role alongside digital methodological knowledge, e.g. in the design of interactive products of serious game-based learning. An example was the use of the evidence-based game "Onya" in school-based prevention and health promotion in AT, CH, and DE (TOLKS et al. 2019). It showed that co-creation of digital transformation by school psychology is important. It required interdisciplinary and multi professional collaboration and exchange of theory and practice. This development was still in its infancy in many digital-related areas. Thus, TOLKS et al. (2020) concluded,

"*So far, there is a lack of infrastructure to enable scientific discourse and networking among actors researching and practicing in the field of serious games and gamification. To push this development, the "Network Serious Games and Gamification for Health"* https://hochschulforumdigitalisierung.de/de/cwg-seriousgameshealth;https://twitter.com/NetGamification *was founded in October 2019. This network is funded as a Community Working Group of the Higher Education Forum Digitization and aims to create a website and database with the current research results, application scenarios and projects and… most importantly, to bring together stakeholders in the field."* (TOLKS et al. 2020, p.704, free translation)

Above all, the Covid 19 pandemic acted as an accelerator of digital transformation in school psychology, with all its "VUCA- characteristics":

- An encouraging example of current progress in educational psychology was offered by the 'AG Psychology and Teach and Learn Research', which was launched in 2021 and, among other things, scientifically examines the experience of face-to-face teaching in comparison with blended learning concepts in teaching and learning (BOHNDICK 2022).

- During this research project, numerous publications on the topic of digitization appeared in response to the Covid-19 pandemic. While only four publications on the topic of "school psychology and media competences" were found in the relevant databases in June 2021, there were 258 publications in December 2021. Thus, the results of this study cannot claim general validity and sustainability but are merely a reflection of the current situation of DT in school psychology practice in BE, CH, DE, and AT.

- The international study by REUPERT et al. (2022) examined school psychology practice during the Covid 10 pandemic in Germany, USA, Canada, and Australia, such as digital-based approaches to supporting students during school closures, remote consultation with staff, principals, parents, and students, and the development and publication of web-based resources. It was concluded that more

research is needed on digital skills of SPs to advocate for further professional development of school-based online interventions.

It remained to be seen whether the boost to remote working by the Covid - 19 pandemic, will be sustainable. School psychology faces some groundbreaking questions in this regard:

- Will the work and research of SP be enriched in the future by topics related to DT?
- Will a special field of 'virtual school psychology' develop examining the impact of DT on development, learning and behavior, such as acquiring math skills under digital conditions (NIKLAS et al. 2020)?
- Will a new discipline, such as cyberpsychology, take over areas of today's school psychology (SCHOOL EDUCATION GATEWAY 2016)?

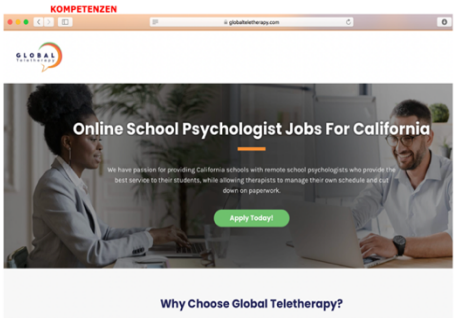


FIGURE 4 *globalteletherapy.com*

In school psychology practice - as everywhere else - DT was not viewed exclusively positively. It also triggered concerns, fears, rejection, or skepticism, e.g. concerning the replacement of psychologists by possibilities of artificial intelligence, the impact of social media on mental health of children and adolescents etc. An example was a 2019 statement by Prof. STEINER, emeritus professor of developmental and personality psychology at the University of Basel and an example of the professional journal of the Bavarian SP association:

"As far as the use of digital tools is concerned, it is up to the parents to decide how often, how long and with what intention their children should and may engage with them. All these devices have advantages that should not be argued away. But in the lessons at our schools they disturb more than they help. Those who learn without them miss nothing." (STEINER 2018, S.32, free translation)

"What kind of psychological findings (research results) are there so far that are relevant for the work of SP...? What do SPs need to know about the effects of being online, such as attention disorders, social disorders, addictive behavior? How can they be helpful in schools, where digitalization is being pushed with all its might, when pupils, teachers and parents reach their limits? Is counseling competence enough or is psychotherapeutic competence increasingly needed? So far, there is a particular lack of long-term studies that examine the development of children and young people in connection with digitization and offer solutions in the event of problematic developments. The idea of digitalized counseling = counseling with digital media also needs to be examined. Perhaps in the future we will have to get used to tele counseling and tele psychotherapy just as we have to telemedicine." (HERTZSTELL 2020, S.20, free translation)

However SP face digital change, it will not simply disappear. McCullough's wake-up call still applied, although he did not yet know the extent of digital transformation today in 1984:

"It is important for SP to be aware of the potential for change that the microcomputer offers to our field. Without knowledge of the potentials and limitations of microcomputers, SP may be allowing someone else to make the decisions about their uses and impose those decisions upon us. Tomorrow depends upon the informed choices made today." (McCULLOUGH & WENCK 1984, p.439)

Translated into today's times, we should refer to the admonition of Ali Mattu, a clinical psychologist who published videos on the YouTube channel "The Psych Show" to provide the public with sound information on psychological topics:

"Psychology is so relevant to everything. There aren't really any areas of life where human behavior, mental process, emotions, all of these things are not applicable and so as a result of that people are having conversations about psychology all the time, in every medium and if …experts in psychology aren't a part of those conversations, they happen regardless, without us. And so, what that means is we can't share our knowledge, our experience with the public -- the public's going to have these conversations and who knows if they're based in real science or not." (APA 2019)

In summary, it can be concluded that knowledge and research on DT and DC in European school psychology was still in its infancy and remote work was only slowly developing.

Against this background, DiCoSP attempted to design a comprehensive digital competence framework for school psychology practice. With the help of a general dimensioning, it covered a broad range of digital-related professional practice in all four countries studied, to provide a structural framework for medium - to long-term challenges for DC of SP. It represented a compass for the necessary prerequisites for SP to be able to act professionally in the process of DT.

Given these tasks, the DiCoSP study was based on the following key hypotheses:

- SP consider DC important in their professional practice
- SP use digital resources in their professional activities
- SP have a need to acquire DC
- SP have insufficient information on DC acquisition
- SPs perceive offerings to acquire the professionally needed DC as insufficient.

and on the following further hypotheses:

- There is a significant relation between the estimated significance of DC and the application of digital resources
- There is a significant relation between the own estimated DC and the application of digital resources

- There is a significant relation between the attitude toward DT and the estimated significance of DC as well as the application of digital resources.

3. THE CONSTRUCT 'COMPETENCE'

3.1. INTRODUCTION

ICT is indispensable in our live and information is ubiquitously available. This state requires people who understand DT, can reflect on it critically, use it responsibly and help shape it creatively. The term 'competence' described these skills succinctly. ERPENBECK and HEYSE (2021) described this state as follows: *"The transformation of the information society into a knowledge society corresponds to a transformation of the qualification society into a competence society."* (ERPENBECK & HEYSE 2021, p.35, free translation)

The Member States of the European Union (EU) and Switzerland (CH) have agreed on the development of such a competence society, mainly through instruments such as the European Qualifications Framework (EQF) (COUNCIL OF THE EUROPEAN UNION 2008) , the Qualifications Framework for the European Higher Education Area (QF-EHEA) (MINISTRY OF SCIENCE, TECHNOLOGY AND INFORMATION 2005), the Key Competences Reference Framework for Lifelong Learning (COUNCIL OF THE EUROPEAN UNION 2018) , the European Reference Framework for Digital Competences (CARRETERO GOMEZ S., VUORIKARI R., PUNIE Y. 2017) and the EU Directive 2005/36/EC on the recognition of professional qualifications (COUNCIL OF THE EUROPEAN UNION 2015) .

After intensive scientific research of the concept of competence, ERPENBECK (2007b) came to the sobering conclusion:

"There cannot and will not be a final understanding of competence, a conclusive definition of competence; those who hope for it hope in vain. But the many attempts to understand competences and to apply what has been understood have led to a clear convergence of views. Today, we know that the concept of competence cannot be dealt with, no matter how many definitional pirouettes there are, and that there is a fundamental historical dynamic behind competence thinking, behind its explosive spread in schools, vocational training, universities and companies." (ERPENBECK et al. 2017, S. XII, free translation)

The concept of competence has a long history in various applied sciences, such as learning and cognitive psychology, and has despite definitional difficulties, achieved a central position in the international education landscape (MULDER AND WINTERTON 2017). This origin was reflected in a wide range of connotations of the term, with two main areas of tension dominating the debate in Europe:

- Economic and technological developments, such as the DT, were forcing the labor market to adapt, so that new professional requirements and structures were developing. These challenges required to adapt educational goals, profiles, learning and teaching methods and programs in the education system. It created a field of tension between labor market-related qualification goals and a holistic concept of education aimed at personality formation, between subject/job-specific and transversal competence.

- Political developments, such as convergence strategies in the EU, required an adaptation of the education system and the labor market to enable intra-European mobility and international competitiveness. Of concern was the comparability and recognition of educational degrees and professional qualifications among different member states as well as the acquisition of competences. This development created a tension between diversity and standardization of different educational and professional models, educational goals, and professional qualifications. The biggest paradigm shift in this context has been initiated by the European Qualifications Framework for Lifelong Learning (EQF), which aimed at output-oriented "competences" in education instead of input-oriented educational goals and programs. This change in the understanding of teaching and learning has led to a permanent and fundamental debate about the concept of competence (CEDEFOP 2008, ADAM 2004).

Given the confusion of the term 'competence' and related terms, this study attempted to find convergences in the conceptual landscape to arrive at a manageable definition. Competence was considered in this study from the perspective of its development and application in concrete digital-related professional situations in school psychology practice. For the sake of clarity, the DiCoSP - study was limited to the convergence of three concepts of competence in education and training that were relevant for school psychology practice and cover a broad range of competence research: the action-theoretical, cognition-theoretical, and self-organizational competence concept.

The DiCoSP study clarified first the term of competence, followed by the term of DC, to assign the subject-related perspective to the contextual conditions of school psychological domains in which competence is realized. Both perspectives formed the basic structure of the DiCoSP framework. The DiCoSP study followed the action-theoretical concept with the goal of achieving competence by self-organization to be able to act in professional situations (ERPENBECK & HEYSE 1999). The concept of competence was classified in professional, methodological, social, and

self-competence (acronym = PMSP) with a respective typology of knowledge, attitudes, and skills (acronym = KAS).

How and why came this modeling about?

BOON & VAN DER KLINK (2002) encouraged the use of the term 'competence', as they considered it to be useful to bridge the gap between education and job requirements. KLIEME and HARTIG (2007a) valued the term because it limited the arbitrariness of definitions. According to them, a SP acting competently does not only have inert knowledge but can repeatedly cope with challenges of professional situations due to the latent characteristic of competence as a guarantee for the constant generation of adequate actions in ever new situations. This is in line with the theoretical approach that "action" and "competence" represent a holistic concept of "action competence" because goal-oriented thinking and acting is generated by the competence of knowledge-based problem-solving (AEBLI 1980). This aspect was also emphasized by ARNOLD, a representative of the concept of competence as self-organizing disposition. He assumed that confidence in one's own competence can only be developed if the emotional experience of self-efficiency is experienced due to successful application of the own qualification in professional situations. For this reason, competence can only develop in a learning process, but cannot be taught (ARNOLD & ERPENBECK 2021).

3.2. COMPETENCE – QUALIFICATION - PERFORMANCE

A distinction must be made between conferred decision-making authority, competence and performance when defining the term 'competence' (WOLLERSHEIM 1993). A SP with a university master's degree in psychology and one year of supervised practice is hired in a public agency. Since he has the required qualifications for the job, he is deemed to be competent to master the professional requirements. Parents may consider this SP to be competent if he helps to find a satisfactory solution to a problematic situation with their child (= personal assessment of a person's competence to solve a problem). Or they consider a SP incompetent because he does not help them as expected, although he has been formally granted a professional authority to act. Their conclusion is a result of an observation and a personal evaluation. Not every person who has a granted qualification is automatically considered as being a competent professional. There are many reasons, such as ethical concerns or inadequate working conditions, why individuals may have competence but sometimes do not translate their competence into expected actions. Thus, inadequate performance in the eye of the observer does not automatically suggest a lack of competence.

Competence is about the personal potential to be able and willing to perform actions.

For ERPENBECK et al. (2017a), it was precisely the inclusion of volitional and emotional aspects, such as motivation, resilience, self-efficacy beliefs, being responsible for differences in the assessment and measurability of competence: *"While properties of physical, chemical, biological objects...exist objectively, as it were, as a matter of course, psychological properties and dispositions are constituted to a much greater extent by the measurement procedure itself. As a result, different measurement procedures, despite all considerations of objectivity, often result in markedly different properties."* (ERPENBECK et al 2017a, p. XVI, free translation) Thus, the interpretation of competence as a disposition is dependent on measurement procedures and their interests.

The term "qualification" differs from the term "competence" in several characteristics, which are summarized in the following table according to ERPENBECK (2002):

Competence	Qualification
is subject - related	is object-related with the aim of fulfilling specified requirements
requires self-organization skills	is externally organized for the fulfillment of predefined goals
refers holistically to a person	refers to required knowledge and skills for an action to accomplish given goals.
includes a multitude of unlimited individual dispositions for action	is related to individual capabilities that are legally anchored
comes close to the Humboldtian concept of education	is not compatible with the Humboldtian concept of education due to the focus on usable skills

ARNOLD (2001) distinguishes between competence and qualification as follows: *"Competence denotes a person's ability to act, whereas the term qualification denotes abilities to cope with concrete (usually occupational) demand situations, i.e. it is clearly use-oriented, the term competence is subject-oriented. It is also more holistically oriented: Competence encompasses not only content-related or technical knowledge and skills, but also non-subject-related or supra-subject-related skills, which are often described using terms such as methodological, social, personal or even key qualifications."* (ARNOLD 2001, p.176, free translation)

REETZ (1999a) also considered the concept of competence to be more comprehensive than the concept of qualification since it expressed the ability to generate behavior based on individual self-organization.

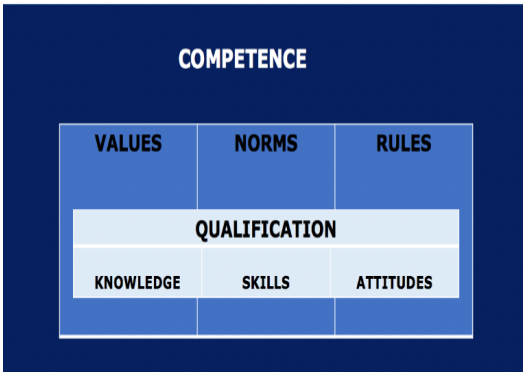


FIGURE 5
Relationship competence-values-qualification, own presentation according to ERPENBECK's model

Often the terms competence-qualification-key-qualification-key-competence-action ability were used synonymously. This study followed the interpretation of ERPENBECK (2015) (Figure 5). Accordingly, competence included qualifications such as knowledge, skills, and attitudes as indispensable components. However, it could not be limited to these, but needed attitudes, emotions, motivations, and judgements to be able to assess the appropriateness of one's own actions. With reference to TEICHLER (1995), 'qualification' is understood as clearly definable knowledge, skills and attitudes professionals need to have to be able to act as required. They are formulated in such a way that they can also be checked and evaluated independently from the application process. An example of this was the legally binding description of Austrian clinical psychologists in the EU - Qualifications Register based on the European Directive on the Recognition of Professional Qualifications:

"The clinical psychologist is able to perform the following activities in a professionally independent, autonomous, self-reliant and scientifically sound manner: Diagnosis of mental disorders and mental illnesses and of psychological influencing factors in other illnesses with different problems and different age groups; preparation of clinical psychological findings and expert reports..." https://www.qualifikationsregister.at/public/qualification/51/ free translation

In comparison, the Examination Regulations 2021 for a Master of Science in School Psychology at the University of Tübingen/DE were an example of competence formulations:

"Graduates will have a broad, detailed, and critical understanding at the cutting edge of knowledge in one or more specialized areas and will be able to,

> *- Apply their knowledge, understanding, and problem-solving skills to new and unfamiliar situations that have a broader or multidisciplinary connection to their field of study (Instrumental Competences),*
> *- Integrate knowledge and deal with complexity,*
> *- Make scientifically sound decisions, even based on incomplete or limited information, considering societal, scientific, and ethical insights that result from the application of their knowledge and from their decisions,*
> *- Independently acquire new knowledge and skills and carry out largely self-directed and/or autonomous independent research- or application-oriented projects (Systemic Competences)*
> *- Communicate their conclusions and the information and rationale underlying them to professional representatives and laypersons in a clear and unambiguous manner given the current state of research and application; exchange information, ideas, problems, and solutions with professional representatives and with lay persons at a scientific level; and assume prominent responsibility in a team (Communicative Competences)."* (UNIVERSITÄT TÜBINGEN 2021, free translation)

In this example, the competence of SP included subject-specific knowledge (knowledge in specialized areas), subject-specific skills (being able to communicate specialized knowledge to others) and transversal knowledge, skills, and attitudes (= key competences, such as being able to draw conclusions, work in a team, client orientation, critical thinking).

At the same time, competence was classified as: professional competence (having and conveying knowledge), social competence (being able to communicate with different target groups) and self-competence (taking responsibility).

Competence needed to be distinguished from performance. Referring to MC CLELLAND (1973) it was important to clarify how competences can be assessed if they represent internalized prerequisites for actions that are not directly observable. For MC CLELLAND, performance was the decisive measure of competence. Competence could only be inferred based on performance as the realization of dispositions. Thus, competence assessment was a subject-centered attribution of dispositions based on observation. Conversely, there was also an attempt to predict performance based on competence. Because of this tautology, the concept of 'competence' was often criticized (MOLDASCHL, 2010).

NORTH (2013) integrated the concept of performance in his competence definition: *"Competence is a well-rehearsed process for activating, bundling, and using personal resources to successfully master challenging and complex situations, actions, and tasks. Competent action is based on the mobilization of knowledge, cognitive and practical skills, as well as social aspects and behavioral components, such as attitudes, feelings, values and motivation...What can be measured and experienced is not the competence itself, but the result of competent action, the so-called performance."* (NORTH 2013, p.43, free translation)

This approach was typical for applied psycho-pedagogical research of competence. As a historical key feature it seeked the practical relevance and considered the relationship of academic expertise, professional situation, and personality development as a unity (KLIEME & HARTIG 2007a).
The DiCoSP model shared this approach by considering both school psychology expertise and generic skills in the competence structure with a reference to domains of practice.
An essential difference between action- and cognition- oriented theories was the motivation of competent actions. While the action-directed theory aimed at maturity or the ability to self-organize (representatives are e. g. ROTH, REETZ, ERPENBECK, NORTH), many representatives of the cognitive-directed theory (KLIEME, WEINERT, OECD) saw competence in the achievement of educational and vocational qualification goals with a clear focus on subject- and job-specific KAS as opposed to generic or transversal KAS. This direction was reflected particularly in standards of general education, which were dominated by functional and subject/profession related models. In the search for generally binding standards, the focus has been on measurability and comparability of individual qualifications. A typical representative of this direction was KLIEME (2003):

"Educational-psychological research shows, however, that it is not sufficient to identify interdisciplinary "key qualifications" as a panacea. Even if components such as methodological, personal, and social competence are significant, they do not replace the

strong subject-specific binding of competence...The question of the scope of competence models can therefore not be answered by contrasting "subject-related" versus "transversal." Rather, subject-related competences provide a necessary foundation for cross-curricular competences. One consequence is that concrete formulations and operationalizations of the concept of competences must first take place in the domains or subjects. This also implies that the development of competence models must be based on the theory and knowledge of subject didactics. ... In addition to the component structure and the subject or domain specificity of competence models, the consideration of competence levels is a central aspect." (KLIEME U.A. 2003, S.75, free translation)

This domain/subject-specific understanding corresponded more to the term of 'qualification' described by ARNOLD (2001) than to 'competence'. Learning was externally determined by prioritized subject didactics and led to subject-related knowledge, whereas action had no relevance. In a competence framework for the practice of SP, however, the reference to action was of relevance.

CALVANI et al. (2008) concluded from an analysis of digital literacy measurement in Europe that there was still a need for research as far as the educational requirements for dealing with new situations due to technological progress were concerned: *"The capacity of facing new situations is an element which characterizes more and more the typical requirements of contemporary society: In any workplace, individuals often have to use new tools and applications. The capability of adapting their own pre-existing knowledge to an unknown technology is therefore an aspect of great relevance, but scarcely enhanced the educational context, where, on the contrary, the tendency to verify the memorization of already acquired knowledge prevails*." (CALVANI u.a. 2008, p. 186)

The OECD promoted a conceptual framework for the determination of key competences developed by WEINERT to be able to define transversal goals in education and lifelong learning (OECD 2001). The concept ultimately also belonged to the cognition-theoretical orientation though WEINERT is regarded as a bridge builder between cognitive and action theoretical orientation in the competence debate. In 1997, the OECD's DeSeCo (Definition and Selection of Competencies: Theoretical and Conceptual Foundations) project defined:

"A competency is more than just knowledge and skills. It involves the ability to meet complex demands by drawing on and mobilizing psychosocial resources (including e skills and attitudes) in a particular context.... Key competencies involve a mobilization of cognitive and practical, creative abilities and other psychosocial resources such as attitudes, motivation and values... At the center of the framework of key competencies is the ability of individuals to think for themselves as an expression of moral and intellectual maturity, and to take responsibility for their learning and actions... Thus, reflectiveness implies the use of metacognitive skills (thinking about thinking), creative abilities and taking a critical stance. It is not just about how individuals think, but also about how they construct experience more generally, including their thoughts, feelings, and social relations. This requires individuals to reach a level of social maturity that allows them to distance themselves from social pressures, take different perspectives, make independent judgments and take responsibility for their actions. ." (OECD 2005, p.4 -9)

Although the emphasis was on cognitive skills, ROTH's influence clearly shined through by naming social maturity as a prerequisite for competence. According to RYCHEN and SALGANIK (2003) three categories of core competences were named as the basis of the DeSeCO model: acting independently, acting in heterogeneous groups and interactive use of instruments and aids. These three categories were considered in the DiCoSP competence framework.

Although the competence concept talked about maturity, the implementation was mainly about measurability of competence in international education studies to be able to make group comparisons for ranking. For example, the DeSeCo model was used in well-known international school performance studies (e. g. PISA, TIMSS, PIRLS and PIAAC). Attitude and behavior as well as self-organization was hardly relevant in these assessments, so that competence could be measured with high test accuracy and be compared between several countries (KLEMM 2014). The reference to psychosocial prerequisites turned out to be rather marginal, so that the measured result could not be reconciled with creative and self-organized ability to act. However, this goal was relevant when it came to professional competences of SP.

Based on their study, ZLATKIN-TROICHANSKAIA et al. (2016) concluded, that there was a significant lack of research on the assessment practices of competences that should ideally be linked to competences in higher education and practical professional application, especially in relation to subject-specific and cross-disciplinary competences. The study showed that methods of measuring competences were still inadequate (VON TREUE & REYNOLD 2017).

Like GNAHS, ERPENBECK (2017 a) assumed that the construct of competence was a subject-related disposition that could be elicited individually. ERPENBECK was concerned with the individual benefit of competence measurement in contrast to the goal of ranking. He saw a variety of possibilities, such as qualitative characterizations in form of competence passports, competence biographies, portfolios, or observations of work samples (BÄCKER & ZAWACKI-RICHTER 2012). ERPENBECK had developed various procedural systems for competence measurement in cooperation with other scientists. In 1996, together with HEYSE, he published the internationally recognized procedure for direct measurement and development of individual transversal professional abilities, the CODE®CompetenceAtlas (Competence-Assessment and Development), which was considered in the DiCoSP study to be able to include important cross-occupational bases of competence in the digital age (HEYSE & ERPENBECK 2007c). An assessment of level differences in competence with the aim of a ranking was irrelevant for the DiCoSP study at this developmental stage, so that the cognition-theoretical orientation in this study was rather neglected in favor of the action-theoretical orientation with a focus on self-organization. This was especially

important in the DT of a profession. Thus, DiCoSP did not contribute to solving the problem of DC measurability.

A common feature of the cognitive and action theoretical concept was the view that competences are learnable and context-dependent dispositions translated into action by motivation and volition. In the action-oriented model, motivation and volition are constituent elements of competence, in contrast to the cognitive-theoretical understanding.
The development of the DiCoSP - model was primarily concerned with a conceptualization of necessary prerequisites for mastering a digital-related school psychological practice. This model could be used as a basis for the development of training offers for acquiring DC. In addition to the assumption that competence is a learnable and context-dependent disposition, the DiCoSP - study adopted the view of the cognitive theory direction that professional competence based on specific topic knowledge, professional skills, and attitudes is an important class of job-specific competence. The empirical part of the DiCoSP study therefore also aimed to clarify in which way SPs considered DC to be relevant in their professional practice and how this consideration translated into digital-related professional competence according to their own assessment.

3.3. KEY COMPETENCE

BUNK (1994) argued that teaching of vocational technical knowledge and skills was no longer sufficient to train the workforce in view of rapid technical and economic changes. Vocational training should impart transversal qualifications that do not quickly become obsolete.

MERTENS (1974) coined the term "key qualification" and thus started the debate about occupation-specific and cross-occupation competences in education. He understood key qualifications as *"knowledge, skills, and abilities that do not directly yield a limited reference to specific, disparate practical activities, but rather a) suitability for a large number of positions and functions as alternative options at the same time, and b) suitability for coping with a sequence of (usually unpredictable) changes in requirements over the course of a lifetime."* (MERTENS 1974, p.40, free translation)

What is interesting for the DiCoSP study about the concept of key competences is that MERTENS explicitly included the management of unpredictable situations, which were a feature of digital transformation.
The terms "cross-occupational and cross-disciplinary key qualifications and key competences" were often used synonymously as "transversal or meta-competences", such as the ability to work in a team, analytical thinking, problem-solving behavior, independence, willingness to learn, ability to process information.

The concept of key qualification by MERTENS triggered a tidal wave of qualification descriptions. In the meantime, there were various catalogs of

key qualifications (or synonymously used transversal competences), such as 21st Century Skills (ANANIADOU und CLARO 2009), Metacompetences (GRAF, GRAMSS, ALTHAUSER, RUNGE 2020), OECD Reference Framework for Key Competences (RYCHEN 2008), Life Skills (WHO 1997), Transferable Skills (UNICEF 2019), P21 - 21st century skills (P-21 PARTNERSHIP FOR 21ST CENTURY LEARNING 2019), Future work skills 2020 (INSTITUTE FOR THE FUTURE 2020). The confusion of qualification, key qualification, competence, key competence, ability to act led to a merely controllable terminological chaos. Despite the terminological ambiguity, MERTENS' concept was further developed by numerous researchers, especially in the field of vocational education (REETZ 1999b, LEHMKUHL 1994, BECK 1995, BUNK 1990, LAUR-ERNST 1996, JÄGER 2001).

In higher education, in line with the EQF, there was a trend to see competences as interdisciplinary goals of learning, which could be acquired within the framework of subject studies, but which could be applied in different contexts and situations (e.g. GONZALES FERRERAS et al. 2011 TUNING MODEL EFPA).

Recent studies on the effects of the DT on occupational requirement profiles seemed to prove BUNK right in that a trend toward interdisciplinary and cross-occupational competences was becoming visible. SCHARNHORST et al. (2018) concluded in their literature study on future occupational requirements that increasingly more transversal competences were needed, with complex problem solving, IT competence, flexibility, social and personal competence in communication, collaboration, customer orientation being the most important. The study by GRAF et al. (2020) on competences needed in the future world of work saw the greatest increase in demand in basic DC, self-reflection, self-organization, dealing with complexity and dealing with uncertainty/risk.

An empirical study by ZINKE (2019) confirmed the trend that, due to digitization, interdisciplinary skills of self-competence played an important role in professional competence: *"The growing dynamics of changing work tasks can best be mastered by strengthening a general occupation-related ability to act and less by merely acquiring ever new occupation-specific competences. The following competences are particularly significant in the view of the interviewees: learning competence, job-specific skills and knowledge, understanding of processes and systems, digital competences, flexibility/spontaneity.*" (ZINKE 2019, S.71, free translation)

ZINKE therefore saw the need to integrate cross-occupational competences into the vocational training curriculum.

PEIFFER et al. (2020) concluded in their empirical study on DC beliefs at workplaces that self-concept and self-efficacy are closely related to how individuals interact with digital systems and are important in dealing with digital resources. Therefore, in facilitative training approaches, such as creating positive mastery experiences in dealing with digital systems or

providing targeted feedback from supervisors when trying out new digital systems, it is important to make sure that learners attribute their successes to their own competence and attribute failure to lack of practice rather than lack of competence. This conclusion supported ARNOLD's assumption (ARNOLD & ERPENBECK 2021) that confidence in one's own competence cannot be built up if self-efficacy is not experienced through successful application of one's own qualification.
SCHAFFAR (2019) described the relationship between digital media competence, key competences, and learning:

"Media competence cannot be taught, it can only be acquired by oneself... to be and remain media competent, one must… constantly inform oneself, know about new apps, trends or platforms and keep moving. This does not require fact-based knowledge, but knowledge based on dealing with processes and dynamics. People, … must know how to navigate around digital cliffs, must be capable of self-control, but above all capable of independent and autonomous thinking. Since no one can predict what developments and twists technological change will take, what is needed instead are the skills to deal with these changes. This involves learning from mistakes, as well as remaining open to new things in the long term." (SCHAFFAR 2019, p.315 free translation)

There have been various attempts to systematize the inflationary term 'key competences'. According to SCHARNHORST et al. (2018) there are four categories of transversal competences that are interesting for the DiCoSP - study:

- Professional, methodological, social, and personal competence (=PMSP) as central elements of action-oriented professional competence;
- General reflective competences, e.g., critical thinking and judgment, forward thinking, planning, dealing with complexity, which have a guiding function by supporting the use of existing competences and the acquisition of new competences through underlying awareness of one's own knowledge and learning and thinking processes.
- Competences for lifelong learning were considered as self-competence. The concept of lifelong learning (UNESCO 1972; DELORS 1996) was another response to the challenges of rapidly changing labor market conditions. According to the "European Reference Framework of Key Competencies for Lifelong Learning" (COUNCIL OF THE EUROPEAN UNION 2018) DC is one of the eight key competences (self - competence) and learning ability another one (methodological competence). The missing empirical evidence of these eight key competences was often criticized (SCHARNHORST & KAISER 2018).
- Language and communication skills were considered to be transversal because they support oral, written, intercultural, and situational communication in native and foreign languages.

The transversal competence categories do not coexist in a separable way and cannot be seen independently of subject-specific competences, especially not of PMSP and reflective competences. Key qualifications and competences are cross-occupational and cross-disciplinary. But the acquisition of transversal competence is linked to coping with concrete societal, occupational, or school requirements and is taught and effective in combination with job-specific competences.

DC can accordingly be classified as a cross-disciplinary and cross-occupational key competence, which is linked to other key competences. In the digital competence framework for SP PMSP were implemented as central classes of professional competence, including further key competences because

- cross-occupational key competences represent an important support for the acquisition and implementation of DC;
- cross-occupational key competences are seen as relevant for a work context under digital conditions.

3.4. COMPETENCE CLASSES

In the field of higher education didactics, especially ORTH (1999) took up the idea of "key qualifications" in her dissertation, trying to establish a bridge between subject-oriented university teaching and professional practical relevance. She put an emphasis on the discussion of different scientific key qualification concepts and their assignment to pedagogical (e.g. BUNK 1991, REETZ 1989, ROTH 1971, LAUR-ERNST 1996, FREUNDLINGER 1992, BECK 1995, NEGT 1998), psychological (e.g. DIDI/FAY/KLOFT/VOGT 1993, WEINERT 2002) and sociological approaches (e.g. GEIßLER/ORTHEY 2002, LANDWEHR 1996). ORTH examined the cited models based on the question, which categorization of key qualifications was valid both in the scientific context and in the professional practice. This criterion was met by the concepts of BUNK, REETZ, LAUR-ERNST and FREUNDLINGER, who regarded the four areas of PMSP as key qualifications.
KOPF/LEIPOLD/SEIDEL (2010) offered a description of the four competency classes PMSP in higher education teaching, which the DiCoSP - study follows (FIGURE 6).

FIGURE 6 *PMSP according to KOPF/LEIPOLD/ 2010*

Competence (PMSP)	Definition
Professional competence	The term professional competence includes school psychological knowledge and methods and their application (cognitive and functional dimension), which are necessary to cope with professional tasks. The specialist knowledge corresponds to the current state of research and is made up of basic and specialized knowledge from the respective subject area and the associated scientific disciplines and general education. In addition, a reflective knowledge and understanding of the most

	important theories, principles and methods of the subject are required.
Methodological competence	Methodological competence is understood to be knowledge and skills that can be used independently of the subject and that enable new and complex tasks and problems to be mastered independently and flexibly. These are prerequisites for the selection, planning and implementation of meaningful solution strategies, such as problem-solving, transfer, abstract and networked thinking, analytical ability, **confident use of computers,** foreign language skills.
Social competence	Social competence refers to knowledge and skills related to communication, cooperation, and conflict in intra- and intercultural contexts. They enable people to act appropriately in relationships with others and to realize individual and common goals. With communicative competence, (subject-related) positions and solutions to problems should be able to be formulated and defended argumentatively to ensure an exchange with experts and laypersons, e.g. through moderation and presentation skills. Collaboration skills include knowledge and mastery of diverse methods for managing group collaboration, such as understanding organizational structures, role flexibility, managing and supporting group development, and formulating and implementing collective strategies. Conflict skills relate to both understanding the function and meaning of conflict and recognizing and constructively managing conflict.
Personal/Self competence	Self-competence is defined as the ability and willingness to develop one's own talents, motivation, and willingness to perform, as well as the development of specific attitudes and an individual personality. Important aspects of self-competence are e.g. o Self-management, such as the ability to handle stress and motivate oneself, as well as setting and realizing personal goals; o the development of ethical awareness and individual attitudes in relation to people, things, or goals; o an awareness of one's own identity and how one fits into societal and social structures, for example, an understanding of one's own role and how to shape one's own life in tension between work and leisure.

This division of competence classes originally went back to ROTH's '*Pedagogical Anthropology*' (ROTH 1968, 1971). It is still fundamental for the discussion of competences due to the definition of the competence concept, the orientation towards the ability to act professionally and especially due to the introduction of the triad of self-competence, professional competence, and social competence.

ROTH understood competence as follows: *"Maturity is to be interpreted as competence in a threefold sense: a) as self-competence, i.e. as the ability to act responsibly for oneself, b) as factual competence, i.e. as the ability to be capable of making judgments and taking action in factual areas and thus to be responsible for them, and c) as social competence, i.e. as the ability to be capable of making judgments and taking action in socially, societally and politically relevant factual or social areas and thus also to be responsible for them*." (ROTH 1971, p.81, free translation)

ROTH's personality theory in turn referred to WHITE (1959), who developed the concept of competence within the framework of motivational psychology. He saw the development of basic professional skills neither as innate nor as the result of maturation, but as the self-organization of each person through long learning processes. He assumed an intrinsically motivated need of human action that pushed for the formation of required skills. Application and use of the competence led in the sense of WHITE to individual efficiency and to performance (GRUNDERT 2012).

WHITE's competence approach was taken up by DECI and RYAN (1985) in their theory of self-determination. Accordingly, the desire to experience oneself as competent was seen as a basic intrinsic human need and the experience of one's own self-efficacy as a motivating factor for the development of competence. People therefore chose those challenges that were neither too easy nor too difficult, but which in any case required an expansion of their skills. When such an optimal challenge was found, people worked continuously to master it successfully. The need for competence and self-determination brought people into a cycle of searching for and overcoming challenges.
A study by LÜHR et al. (2020) on the question of how people experience DT led to the conclusion that a fearful - skeptical or open-minded attitude depends on how the impact of DT on one's own ability to act is experienced. This result confirmed important assumptions made by DECI and RYAN. The evaluation of the DiCoSP online survey of SP therefore analyzed whether a connection could be found between the attitude toward DT and DC.

ROTH saw competence in line with WHITE (1959) as individual ability in the sense of dispositions for action and judgment. He described the human ability to act on different levels of development with the mature moral decision-making as the highest level. For ROTH, competence does not mean the development of cognitive powers, but is for him the expression of "critical-responsible" and "critical-creative" capacity for action as the guiding principle of education. *"The human ability to act is for us the necessary and at the same time dominating point of reference, since in it the interaction of all human powers and abilities is expressed and fulfilled. In the acting human being, the different systems of forces and abilities do not appear separately, but in their cooperation."* (ROTH 1971, S.381, free translation)

JÄGER (2001) and BRATER (2016) shared this view: *"The synergetic interaction and networking of social, personal, methodological and professional competence results in action competence."* (JÄGER 2001 S.135, free translation) *"Competence in this sense means that a person is capable of precisely this interaction in a "self-organized" (i.e., ego-strong and autonomous) manner."* (BRATER 2016, S.211, free translation)

In vocational education and training, ROTH's understanding of competence as 'professional action competence' has prevailed. It could be interpreted in the sense of a 'super competence' as *"enabling the individual to act independently and comprehensively in different contexts [...] Competence is related to the personality (values, emotions, motives and motivations) of the individual and thus pursues a holistic claim. The focus of consideration is the comprehensive professional ability to act, composed of a bundle of professional competences, methodological competences, social competences and personal competences; these create the basis for the independent planning, execution and evaluation of the assigned work and tasks as well as for the reflection of one's own professional actions.*" (FRANK & SCHREIBER 2006, p.8, free translation)

In the professional literature, there was mostly agreement that professional competence was constructed via the four competence classes of PSMP and that competence was a subject-related approach (FREY 2006). Various competence concepts in the professional as well as in the scientific area tied in with this classification introduced by ROTH and extend it partly by differentiation of professional competence into technical and methodological competence (APPENDIX 1). The model of the 'Berlin Transfer Office for Additional Qualifications for Digital Competences (SCHRÖDER 2018) showed that this classification of competences could also find a meaningful application in the context of DC.

Action-based competence models, such as that of REETZ, JÄGER, ERPENBECK were compatible with the concept of the "Frankfurt Triangle"**,** which originated from computer science and was a central element in the development of a concept for education in a digitally networked world in German-speaking countries in Europe (WEICH 2019). The "Frankfurt Triangle" assumed that the manifestations of digitization have different, mutually influencing aspects, namely a technological, social-cultural, and application-related perspective. The application-related-interactive perspective (how do I use this?) required action competence and personal competence, the socio-cultural (which effect does it have?) social competence, and the technological perspective (how does this work?) technical and methodological competence. These three perspectives were considered in the construction of the DiCOSP competence framework in the form of the PMSP competence classes.

Because of the convergence, the DiCoSP - study subscribed to the understanding that

- 'Competence' is a willingness to act professionally through self-organized bundling of the existing resources of an SP. This understanding forms the core of competence as self-organization;
- 'Competence' is a bundling of professional, methodological, social, and personal competence,
- 'Competence' is a sign of "maturity" including critical, responsible, and creative attitudes,

- ‘Self-efficacy’ is an important condition of competence acquisition,
- ‘Competence’ is situation and context specific and can be learnt.

3.5. TAXONOMIES

The debate on key competences resulted, among other things, in the "European Reference Framework Key Competences for Lifelong Learning" (COUNCIL OF THE EUROPEAN UNION 2018). The concept of competence aimed at maturity including personal, social, and labor market related aspects.

"*Key competences are those which all individuals need for personal fulfilment and development, employability, social inclusion, sustainable lifestyle, successful life in peaceful societies, health-conscious life management and active citizenship.*" (COUNCIL OF THE EUROPEAN UNION 2018, p.7)

A theory of transversal competences was not yet available, so that only partial models could be used to clarify individual transversal competences.

The theoretical conceptualization of the competence concept in the EQF (COUNCIL OF THE EUROPEAN UNION 2008), and the European Reference Framework Key Competences for Lifelong Learning was developed by WINTERTON, DELAMARE-LEDEIST & STRINGFELLOW (2006). The Reference Framework defined the terms of KAS and competence as follows:

" *… competences are defined as a combination of knowledge, skills, and attitudes, where:*
a) knowledge is composed of the facts and figures, concepts, ideas, and theories which are already established and support the understanding of a certain area or subject;
b) skills are defined as the ability and capacity to carry out processes and use the existing knowledge to achieve results;
c) attitudes describe the disposition and mind-sets to act or react to ideas, persons or situations." (European Commission 2018, p.1)

The theoretical concept using KAS as typology was unsystematic, because

- the basis for the development, assessment and evaluation of competences and KAS was missing (COLES & OATES 2005),
- the relationship between knowledge and performance (FISCHER 2010) was not clarified,
- there were no theoretically based learning outcome concepts.

Despite all criticism, this categorization has prevailed in Europe. As the synergy formation of the triad in ROTH (1971) leads to the ability to act, SCHARNHORST AND KAISER (2018) also emphasized this synergy for the

typology of KAS: *"These resources are not acquired in a 'vacuum' but always in connection with the development of a competence to cope with a specific situation."* (SCHARNHORST & KAISER 2018, p.77, free translation)

Given the lack of theoretical underpinning, both the European Reference Framework on Key Competences for Lifelong Learning (COUNCIL OF THE EUROPREAN UNION 2018) and the EQF have drawn on existing taxonomies, especially the taxonomy of BLOOM (1956) and KRATHWOHL (1975).
BLOOM and KRATHWOHL developed a classification system with three main areas to which learning objectives were assigned:

- Cognitive learning objectives included remembering or reproducing what has been learned and problem solving: the learner identified the main problem and rearranged and combined it with previously learned methods, ideas, and procedures;
- Affective learning goals referred to emotions, such as motivation, interests, attitudes, appreciations, values, attitudes, complex personality traits;
- Psychomotor learning objectives emphasized muscular or motor skills and related to the use of (technical) equipment and procedures, objects, or actions that required neuromuscular coordination.

Based on BLOOM's taxonomy, the educational psychologist KRATHWOHL developed the affective domain taxonomy according to the principle of internalization. Internalization was understood as a process by which a person's affect toward an object was internalized from a general level of consciousness to an affect that consistently directed and controlled behavior (ANDERSON, KRATHWOHL 2001).

KRATHWOHL divided cognitive processes into six different categories: remember, understand, analyze, apply, evaluate, and create. By referring to these taxonomies, a level distinction was established in the EQF, which was also reflected in the European Digital Competence Framework for Citizens (CARRETERO GOMEZ, VUORIKARI, PUNIE 2017). In her study, KIESLER (2020) was able to prove that the taxonomy according to KRATHWOHL was suitable for modeling and classifying DC.

Both the action – oriented approach of competence and the taxonomy of learning objectives have been widely used in the debate on competence. They differ in perspective in that professional competence starts from individual competence and taxonomies from the learning process.

The European Reference Framework Key Competences for Lifelong Learning had an impact on the standards in Europe as a result of European cooperation in the field of education and training, which focused on defining common objectives and indicators. Since the framework

defined all terms of 'competence', 'key competence' and 'digital competence', it was considered in the digital competence framework of this study. Due to a lack of sound theoretical foundations of the term of transversal competences and in view of the widespread use of the WINTERTON and BLOOM/KRATHWOHL taxonomies, both were considered in the DiCoSP model. An overview of the categorization of digital competence foundations based on the BLOOM/KRATHWOHL taxonomy for this study can be found in the APPENDIX 2.

The DiCoSP study has adopted the interpretation that

- Competence is based on knowledge, skills, and attitudes (KAS),
- DC is interrelated to other key competences,
- DC has the rank of a cultural technique,
- DC is acquired throughout life through formal, non-formal and informal learning in all environments.

3.6. COMPETENCE AS SELF-ORGANIZATION

ERPENBECK developed an internationally recognized model of an action-theoretical understanding of competence with a system-theoretical and constructivist-oriented approach. He understood 'competence' as:

"Dispositons of self-organization of mental and physical acting, if one understands dispositions as the totality of inner preconditions for the mental regulation of an activity... Individual competences are thus founded by skills, knowledge and qualifications, constituted by interiorized [...] values (valuation), dispositioned as abilities to act in a self-organized and creative way, consolidated by experiences, realized on the basis of will and manifested as performance." (ERPENBECK 2010, S.52, free translation)

According to ERPENBECK, competence is part of the personality, but not a personality characteristic (ERPENBECK & HASEBROOK 2012). The conceptual connection between self-organization and competence tied in with the Humboldtian tradition of education, which saw the self-cultivation of the subject prior to its social utility. His model also built on the concept of competence of WHITE (1959) and ROTH (1971) and was similar to the models of REETZ (1999a) and JÄGER (2001) in its classification of competence. In contrast to REETZ and JÄGER, ERPENBECK did not place action competence at the center of his model, but rather self-organizational ability, although ERPENBECK himself and DÖRGE (2012) emphasized commonalities:

"Action competence and self-organizational ability are understood to be abilities that enable the owner to apply his acquired knowledge, skills and behavior in the personal, professional and social spheres of life and to implement them in a goal-oriented manner. Furthermore, these terms also include dispositional and volitional aspects, i.e. not only

the application of skills but also the will to do so." (DÖRGE 2012, p.118, free translation)

ERPENBECK argued that competences as dispositions generate self-organized acting. Such an interpretation allowed to capture competences via performance. This understanding of the relationship between competence and performance (ERPENBECK & GROTE & SAUTER 2017a, S. XVI) could be interpreted as a generative relationship in the sense of CHOMSKY (1965).

ERPENBECK considered its approach to be compatible with the EQF, since responsible self-organization skills in the personal, active-situational, technical-methodical, and social areas were included in the understanding of competence (ERPENBECK & VON ROSENSTIEL 2007b, p. XIV).

ERPENBECK's concept was interesting for the DiCoSP study because it related to the requirements of the DT.

*"Competence is the ability to act self-organized and creatively in unexpected, open situations (self-organization dispositions)." (*ERPENBECK 2012b, p.24, free translation)
„Self-organization - the term means an understanding of creative handling of openness and uncertainty supported by theories (synergetics, autopoiesis, constructivism, systemic approach)... What is new is that with the dynamization and globalization of knowledge, life processes, economic and political upheavals, this ability is becoming a requirement for more and more people in more and more every day and work situations." (ERPENBECK & HASEBROOK 2012, p.237, free translation)

ERPENBECK's term of self-organization found a basis in SCHMIDT's (2005) theory on cognitive autonomy. SCHMIDT assumed that the path from learning to self-learning, from observation to self-observation, must occur in teaching and learning processes because cognitive systems need to relate constantly to their environment to remain capable of social action. ERPENBECK explained his concept in this context:

"*Competences cannot be taught but can only be built up in a self-organized way while mastering real challenges. In this process, values close the gap between knowledge on the one hand and action on the other. In the future, learning will be characterized by self-organization, by the ability to absorb surroundings and to produce new solutions and new ideas as well as new actions from within. ... Competence-oriented learning arrangements include not only knowledge but also values, rules, norms, and experiences. Feeling, intuition, and creativity also play a decisive role in dealing with knowledge. ... Digitization is giving this development a tremendous speed boost, making it unavoidable to actually work with these new technological learning methods. ... Digitization makes it necessary to be able to learn and act quickly, spontaneously and in a self-organized manner at the workplace and on the Net. Memorized expertise is no longer sufficient."* (SCHRITT 2017, p.70, free translation)

The aspect of self-organization in the concept of competence developed mainly since the 1970s due to new findings in biology, neuroscience (HÜTHER 2016, MATURANA et al. 1990, ROTH & SCHWEGLER 1980) and synergetics (HAKEN & SCHLEPEK 2010), which contributed to the development of a theory

of self-organization of complex systems. These models could explain the spontaneous emergence and change of order patterns in complex, open, dynamic, and nonlinear systems. The transfer of key theoretical concepts of self-organization seemed to be promising in psychology, as it enabled behavioral analysis of individuals in a socio-cultural context, such as the digital space (TSCHACHER 1997).

Self-organized systems formed their own stable order by using intrinsic system elements. An organization, team, or individual used their own acquired competences to ensure - from a biological perspective, its own continued existence - from a psychological perspective, its self-determination, even under digital conditions (MATURANA & VARELA 1990).

In this study, self-organization was understood as the creation of order with the help of self-regulation through internal structuring, with the help of self-control through external structuring and with the help of self-determination (DECI & RYAN, 1985) through the fit between internal and external structuring (REINMANN 2009). Self-organization was subject to personal (WIRTH & LEUTNER 2006) and situational conditions, such as data protection regulations.

Important assumptions of self-organization theories were:

- People are complex "systems" that operate in a complex set of conditions with different influencing variables (e.g., social, psychological, environmental).
- Self-organization generates the spontaneous emergence of new structures and behaviors.
- Self-organizing systems, as persons or organizations, have an inherent momentum due to the interaction between the pursuit of stability and best possible adaptation to environmental requirements. As soon as a critical point is reached, the destabilization of the established order ("chaos") occurs. It is followed by a phase of reconstitution at a higher level. Thus, it is not a continuous development, but rather a "qualitative leap". This fact implies that the development of self-organizing systems is not predictable in the long run.

The aspect of self-organization in the concept of competence is a suitable approach for dealing with professionally complex, unstable, crisis situations due to the digital transformation. An example of this mechanism was offered by the 2020 annual report of a School Psychological Service in CH (see p. 9), which was written under the impression of the Covid 19 pandemic with the need to turn to remote school psychological services ("*immediate digital adaptation pressure").* The situation evoked instability (*"Physical presence can only be partially simulated online to be therapeutically useful.")* SP faced new structures/behaviors (*"It was a new territory to conduct assessments with parents and teachers "online".*). Familiar forms – pursuit of

stability- were used as much as possible ("*In terms of our IT provision, we were already in a good starting position; for example, the SPD team had immediate access to a Citrix remote environment …")*. Adaptation processes took place ("*Purchase and application of a new case database", "In the case of such a development, the school psychological services should also expand their services and align them with the new problems"*) to restore stability in form of continued school psychological services*.* ERPENBECK called this self-organizing ability ‚competence'.

The Seven-Phase Model of STREICH (1997) for coping with change processes corresponded with the view of self-organization. It was considered in the DiCoSP - study to be able to depict coping mechanisms of SP in a process of DT. School psychology services were supposed to be resilient regarding DT if they could

- cope with 'VUCA' challenges,
- cope with crisis situations,
- survive as a service in the long run (FINKE 2014).

A resilient organization could deal with shocks and disruptions in a self-regulating manner by striking a balance between the elements of robustness, agility, and stability (WÜTHRICH 2015).

ERPENBECK distinguished between three types of competences: basic, derived, and transversal competences (HEYSE, ERPENBECK 2009). The four basic competences resulted in self-organizational ability, which led to a person's ability to act:

- **(P) Personal competence** as the dispositions of a person to act in a reflexively self-organized way, i.e. to assess oneself, to develop productive attitudes, values, motives, and self-images, to develop one's own talents, motivations, performance intentions and to develop and learn creatively. These psychological aspects were considered by ERPENBECK to be learnt. Reflection was an essential part of the acquisition of competences.
- **(A) Activity- and implementation-oriented competences** as dispositions of a person to act in an active and holistic self-organized manner for the implementation of intentions, plans and projects - for oneself or for others and with others, in the team, in the company, in the organization. These dispositions captured the ability to integrate into one's own will emotions, motivations, skills and experiences and other competences and to successfully realize actions.
- **(F) Professional-methodical competences** as dispositions of a person to solve problems in a self-organized manner using professional and instrumental knowledge, skills in a creative manner, to classify and evaluate knowledge in a sense-oriented manner, to design activities, tasks, and solutions in a

methodically self-organized manner and to develop the methods themselves in a creative manner.

- **(S) Social-communicative competences** as dispositions to act in a communicative and cooperative self-organized manner, to creatively engage and collaborate with others, to behave in a group- and relationship-oriented manner, and to jointly develop new plans, tasks, and goals.

VON ROSENSTIEL's explanation of the basic competences clarified the anchoring of the ERPENBECK concept in the classical categorization of PMSP:

"From this point of view, the concept presupposes personal competence in the sense that people act in a self-responsible manner, guided by values. In *this context, it should be recognized that work is increasingly not carried out in isolation, but together with others - such as colleagues in a team, with superiors and subordinates, with customers or cooperation partners from a wide variety of cultures, or with representatives of the public. Accordingly, social, and communicative competence is also required. Since there is an increasing scientification of almost all areas of life, relevant knowledge must be acquired. But in each case it must be creatively combined and tested in a new way to solve the problem. This is a trial and error action, which now again requires considerable technical and methodological competence*." (VON ROSENSTIEL 2001, p.31, free translation)

ERPENBECK himself sums up "*Apart from nuances (separate treatment of technical and methodological competence, self-competence instead of personal competence), almost all action-oriented competence considerations start from these three key competences.*" (ERPENBECK & HASEBROOK 2012, p.239, free translation)

The definition of the competence concept according to ERPENBECK was used as a template for the DICOSP definition because the concept was compatible with an action-theoretical understanding of competence, with an understanding of competence in the context of digitization, with the consensus-based division of four competence classes, and with basic political educational instruments in Europe. The DiCoSP - study was limited to the four competence classes PMSP for the purpose of clarity. The action - oriented part of competence in the ERPENBECK model was interpreted as part of personal competence. This was arguable, as VON ROSENSTIEL himself stated:

"Discussions exist about whether action-oriented and implementation-oriented competences should form a class of their own. At times they are taken to be merely 'integrals' of the others….or one assigns action-oriented competence to Personal Competence, Social-Communicative Competence, or both." (ERPENBECK & VON ROSENSTIEL 2003, p. XVI, free translation)

In contrast to the ERPENBECK model, methodological competence was listed separately from professional competence as a fourth competence since it played a particularly important role as a competence class for most of the foundations of professional DC. Digital methods could

innovatively expand the practice of school psychology, so that they were a key feature of an active design of digital-related school psychology.

In line with the above-mentioned interpretation of ERPENBECK (2012) on the relationship between qualification and competence, the DiCoSP study assumed that competence was not only a combination of knowledge, skills, and attitudes, but that these elements were constitutive.

The DiCoSP competence framework took over from the templates that

- 'Competence' is a disposition for professional action through self-organized bundling of an SP's existing resources. This understanding formed the core of competence as self - organization;
- 'Competence' consists of four competence classes: professional, methodological, social, and self/personal competence (PMSP);
- Each competence class is constituted of knowledge, skills, and attitudes.

3.7. COMPETENCE ACQUISITION

VON ROSENSTIEL pointed out that there is still a need for research in the field of competence development through self-organization:

"The development of competence, whether in the technical-methodical, social-communicative or personal field, requires self-determined, self-organized and self-responsible action, which can develop most authentically in the process of work itself, where it is necessary to innovatively solve the problems that arise and to reflect on, correct or continue the solution process, in order to secure the acquisition of competence in this way.... The how, however, urgently requires research to be able to design work in such a way that it not only leads to the defined factual goals, but also improves the competence of the workers at the same time....In view of the unquestionably growing importance of network learning, research is urgently required to set the course before a suboptimal structure has solidified that is difficult to change. In particular, it is necessary to ask how learning on the Net can be optimally combined with other forms of learning in order to contribute to the acquisition of competences." (VON ROSENSTIEL 2001, p.35/36, free translation)

The DiCoSP study contributed to this task insofar as SP's DC acquisition was analyzed.

FRANKE (2005) pointed out that there was still a need for research to clarify which competence characteristics ensure competence development, such as a positive emotional connection to the subject area or the positive self-esteem of the actor.

One criticism of the understanding of competence through self-organization was the exclusive emphasis on individual responsibility. Professional action does not take place in a vacuum, but is integrated into real structures, such as the organizational structure of a school psychology service. KIRCHHÖFER (2004) brought this criticism to the point:

"The essential insight of the action - oriented concept in our context is that with the dissolution of the boundaries of work and learning, individuals must learn to extract the meaning of their actions from within themselves, but this act of self-creation is not that of an isolated individual. Self-creation can become an autistic reflection when the reference to the other is lost. This identity - and here are the limitations of self-organization theories - is not a self-sufficient autopoiesis, but aggregates the shared experiences gained in cooperation. The hypertrophy of the self cannot make one forget that this self is a socialized and a socializing given... With the term learning culture, finally, these relations of individual and society, subjective and objective, relations and behavior are put together." (KIRCHHÖFER 2004, p.11, free translation)

KIRCHHÖFER thus ties in with the understanding of DC as an agent of cultural development and justifies the inclusion of the work environment in a digital competence framework. DC alone will not master the DT of the labor world. It also requires adequate structural conditions for it in education and training as well as in the workplace.

A model example for the inclusion of the work context in a competence model can be found in the systemic concept of DEHNBOSTEL (2005) for reflexive action ability, which integrates the acquired professional competences into an organizational structure.

DICOSP prefers this systemic point of view and follows the considerations of ERPENBECK as one of the few competence researchers who considered the role of socialization by pointing out that values are learned and internalized in social situations through interaction. Given

- the cultural transformation of society through digitization,
- the importance of the digital infrastructure for a person's scope of action,
- the assumption that digital skills acquisition also results in a change in working and learning culture,

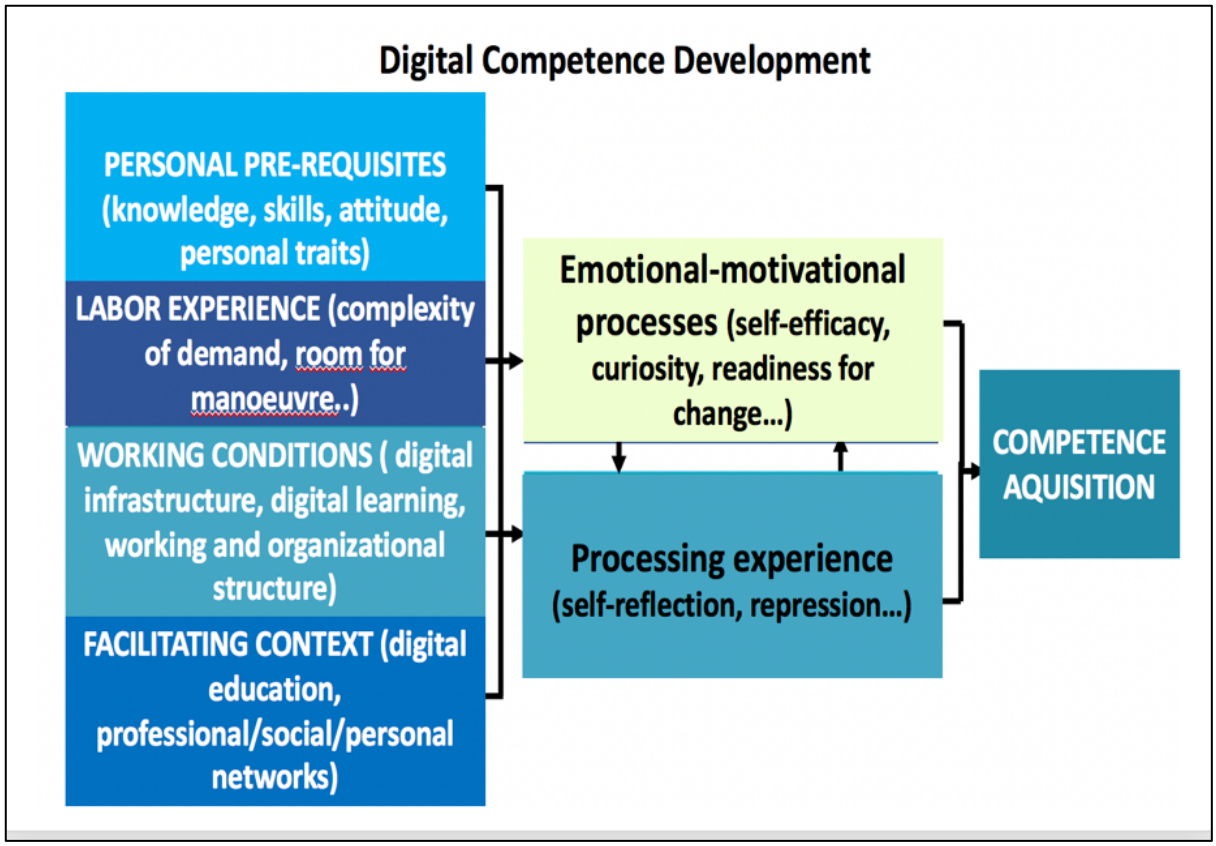


FIGURE 7 *Own illustration based on the FRANKE 2005, p.56*

the DICOSP study relativized the subject-related aspect of self-organization by considering the professional context conditions as an influencing factor on the acquisition and performance of DC in the DC framework. A digitally competent organization is an essential context of SP's DC in practice, since the organization demands and conveys competence and allows competence to become effective (REINHARDT 2020, KAMPYLIS et al. 2015). These considerations merged in the FRANKE model of determinants of competence acquisition (Figure 7). The DICOSP - study assumed according to the model that several factors played a role in the DC acquisition and implementation of SP in professional practice. Important determinants of the development of competences were, in addition to personal prerequisites, favorable experience contexts, the potential of work experience and the framework conditions of the job, which contributed to the acquisition of DC via emotional-motivational processes and experience processing.

ROTH (1971) held the view that the ability to learn can increase into productive creative power forming the basis for cultural development. ROTH's idea was taken up by LANGEMEYER (2005) in relation to the work context:

"*Learning can be understood in such a comprehensive sense not only as the acquisition of cognitive structures and behaviors, but potentially also as a productive change in practice, work tools and methods, and can be linked to both internal (psychological,*

cognitive) and external (social, cultural, societal) development." (LANGEMEYER 2005, p.13, free translation)

In this context, the comprehensive concept of REETZ (1989) for the systematization of key qualifications was to be emphasized. He was concerned with integrating the concept of key qualification into a concept of personality development in contrast to the purely labor market-related concept of MERTENS (1974). REETZ appreciated ROTH's concept of personality development because all psychologically relevant systems of the personality, such as willing, feeling, thinking, learning, and acting, were integrated. He pointed out that this understanding of competence was accompanied by a changed, personality-oriented vocational training practice (REETZ 1999a).

ROE (2002), who was instrumental in developing the EUROPSY model of professional competences in psychology, underscored the relevance of ROTH's (1971) and REETZ's (1999b) competence understanding for psychologists by critically noting that input and output models in higher education did not adequately prepare students for the psychology profession because they hardly considered personality traits and attitudes.

"*Although one might argue that attitudes are generally underrated in educational systems, and that attitudes are somehow addressed by ethical codes, it is remarkable since attitudes vis-à-vis the client and the profession are perhaps the most outstanding feature differentiating psychologists from other professionals*." (ROE 2002, p.196)

In the spirit of ARNOLD and ERPENBECK (2021), he pointed to the need for practice-based competence development in psychology training: *"Since competences can only be acquired in practice, i. e., by performing the required tasks, duties, and roles, there is a need for a system of professional training that allows graduates entering the field to learn from practice without carrying full responsibility for clients."* (ROE 2002, p.198)

In LANGEMEYER's (2005) sense, the acquisition of SP's DC meant at the same time a cultural change in school psychology practice under digital conditions, as MARTIN's (2008, p.167) mentioned three-stage model illustrated. According to the understanding of ERPENBECK, HEYSE, ARNOLD & VON ROSENSTIEL (2001, p.32) competence in the digital age required a high ability to self-organize. Since self-organization cannot be taught, a new learning culture with its own learning and development didactics was required. (ERPENBECK, SAUTER 2013; SAUTER 2016). In the ERPENBECK model, the acquisition of competence was seen as a lifelong individual learning and development process with different types and forms of learning.

BRATER (2016) explained how this learning could take place in the context of university teaching: *"In order for scientific knowledge to contribute to competence building, students need practical experience spaces and diverse, also non-*

academic opportunities to develop their personalities. Competence-building and -maturing learning is an intrinsic movement through which learners develop skills for self-organized and appropriate problem solving. This learning moves in a learning environment, but at the same time realizes a learning interior world (self-learning). Competence-building learning requires a change in the learning culture from input to infrastructure, from subject-specific systems to situational dynamics (learning in and through key situations typical of the requirements) and from instruction to self-directed learning...At the same time, the role of the teacher changes fundamentally, namely from "teacher" to "learning (process) facilitator". The learning facilitator sets the task and guides the reflection. For experiences to become experiences and experiences to become competences, the experiences and experiences must be reflected upon." (BRATER 2016, p.208, free translation)

According to this approach, the central concern of teaching, was to create frameworks and opportunities for learning processes through self-organization. Learning was understood as a self-directed process of active appropriation through experience and reflection of experience. The concept followed the learning psychological approach of constructivism (SIEBERT 1999). The construction process of learning was based on reflective competence, which according to GREIF (2008) could be defined as a process "*in which a person reflects and explicates his/ her ideas or actions that relate to his/ her real and ideal self-concept. Self-reflection is outcome-oriented if the person develops inferences for future actions or self-reflections in the process*." (GREIF 2008, p.40, free translation)

ARNOLD (2014) brought the concept of enabling didactics (ARNOLD & SCHÖN 2019) into play in the interplay between constructivism and cognitive learning goal taxonomy, which focused on self-directed learning for competence acquisition. For ARNOLD, action and competence belonged together because competences only develop in a situated learning process. In situated learning, learning takes place in specific contexts of action and experience that provide an interpretive background for the evaluation of learning content and thus bring about concrete learning experiences. ARNOLD (2017) pointed out the paradox of pedagogy in guiding self-organization and the need for a paradigm shift in education: "*To this end, educational institutions must transform themselves into spaces of self-organized learning in which diverse approaches to acquiring and testing competences are offered and accompanied in a climate of appreciation and encounter."* (ARNOLD 2017, p.98, free translation)

Particularly with the development of Web 2.0, there has been a paradigm shift (REDECKER et al. 2009a) in education toward self-organization through a movement against the interpretive power of experts, against externally determined learning in closed systems. The goals were open learning resources (e.g., open content/science), participation and social networking (e.g., in learning communities), the dissemination of user-generated content (e.g., in photo or video portals), the creation of the self (e.g., in the form of one's own blogs or podcasts), and active-constructive, self-organized learning.

Constructivist-oriented didactics found their way into the training of SPs, as FUCHS & ROGMAN (2012) pointed out in connection with experience-based learning as a model for theory-guided key competence facilitation in psychology courses. The training regulations for the 'Master of Advanced Studies in School Psychology' at the University of Zurich were an example:

"*Students have to complete a total of 35 units of self-awareness. ... The goal of self-awareness is the recognition of one's own difficulties and problems as well as one's own resilience and how to deal with stress, criticism, overload, peer pressure, discrimination, abuse, bullying, etc. can be topics of self-awareness. In the self-awareness, ideally, one's own reactions and actions in everyday school psychology are illuminated*." (PSYCHOLOGICAL INSTITUTE UNIVERSITY ZÜRICH, S.8, free translation)

The relationship between skill acquisition, self-efficacy, and self-organization was particularly relevant for the development of a digital competence framework for school psychology practice as it related to adult learning. MORRISON, ROSS & KEMP (2007) saw the following characteristics of adult learning:

- Interest in the usefulness and relevance of the training content for professional practice;
- When participating, high motivation and preference for clear structures (learning objectives, process, etc.);
- Effective use of own time;
- Interest in sharing own professional and social experiences in continuing education;
- Preference for self-organized and independent learning;
- Preference for the role of teachers as facilitators of learning processes;
- Interest in participating in decisions about the training course;
- Interest in working collaboratively in groups and solving real-world problems.

These features were in line with a learning culture towards self-directed learning. However, the research of ROHS, BOLTEN & KOHL (2017) led to the conclusion that despite the importance of digital systems in the labor world, there were hardly any orientation possibilities regarding necessary media pedagogical competences in adult education. They therefore called for the anchoring of competence descriptions in the core curricula of adult education and the development of sectoral competence models.

Since the opinion was shared that competence cannot be taught but only be learnt in a lifelong process, it made sense to include the context of competence acquisition in the DiCoSP study. The need for further DC training for SP, the acquisition of DC and the conditions of the working environment were analyzed to be able to draw conclusions as to whether and how the acquisition of DC and the digital usage by SPs was influenced by external conditions.

As key competences were identified as an important component of digital use patterns, the DiCoSP study also analyzed whether relevant key competences had an influence on SP's DC. From this, conclusions were drawn on the need to consider transversal competences in a digital competence framework for SP.

3.8. CONCLUSION

Since a clear, universally valid definition of the term "competence" has been lacking, the DiCoSP study selected convergences in the competence debate that were capable of consensus as a basis for the development of a digital competence framework for SP. The following concept of competence resulted from this work:

- 'Competence' is subject-related and situation-dependent and is therefore closely related to professional activity fields of SP;

- 'Competence' is an individual disposition of self-organization, whereby the activation and synthesis of a person's capacities intertwined in a complex manner in form of knowledge, skills, attitudes, and personal characteristics leads to the responsible ability to act in professional situations. Attitudes and values are of special importance in the context of the psychology profession.

- 'Competence' is composed of the competence classes of professional, methodological, social, and personal competence (PMSP)

- A self-organized, ethically grounded, critical-creative, and goal-directed capacity for action is anchored as a concept in educational psychology and in the professional understanding of psychologists, and therefore comes into play in the DiCoSP competence framework.

- 'Competence' is not directly observable and measurable but can only be concluded from the generated performance. Such an understanding required of a DC framework that the description of subject-related DC be brought into the context of professional fields of activities and tasks in school psychological practice as a situational reference.

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- 'Competence' is an agent of learning and work culture, so that a holistic - systemic understanding of competence required considering the work context.

- ‘Competence’ and action form a unit because competences are acquired, promoted, and become effective in a job-specific learning process, but cannot be taught. Therefore, competence development requires opportunities for self-directed, experience-based, situated, and problem-solving learning.

- As a key competence, ‘digital competence’ is closely related to other key competences.

- The DiCoSP competence framework is based on the understanding of an action-oriented model developed by the ERPENBECK circle. It aims at self-organization because it considers all the characteristics mentioned. Methodological competence was listed as a separate competence class due to its particular importance in DT. For clarity, the activity and implementation competence according to ERPENBECK was integrated into the 'self-competence' class.

The following DiCoSP definitions of competence derived from this understanding:

Competence in school psychology practice is a disposition to be able to act in professional situations in a self-organized, creative, critical, responsible, and goal-oriented manner within an organizational structure based on individual resources – a set of personality traits, knowledge, skills, and attitudes. Competence consists of a synthesis of professional, methodological, social, and personal competence (PMSP).

Professional competence is a disposition to be able to act in professional situations in a self-organized, creative, critical, responsible, and goal – oriented manner within an organizational structure based on individual resources – a set of personality traits, school psychology knowledge, skills, and attitudes.

According to the KODE® competence atlas (HEYSE 2017) the class of professional competence included:

School Psychological knowledge, skills and attitudes
Teaching skills
Analytical skills
Conceptual strength
Organizational skills (project management, organization of digital collaboration in virtual teams)
Leadership competence
Knowledge orientation
Objectivity
Goal oriented behavior
Professional recognition
Goal oriented leadership
Planning behavior
Awareness of consequences
Diligence
Evaluation skills

Methodological competence is a disposition to be able to act in a

self-organized, creative, critical, responsible and goal-oriented manner within an organizational structure on the basis of individual resources - a set of personality traits, school psychological knowledge, skills and attitudes - in professional situations with methodological requirements, to structure the work process and to select, apply and evaluate solution strategies independently, appropriately and according to the situation, as well as to develop methods creatively

The class of methodological competence included:

Technical problem solving ability
Systematic-methodical approach
Evidence based approach
Consistency
Perseverance
Knowledge in data processing
Handling of digital collaboration and communication tools
Application of digital apps and software
Technical knowledge (cloud computing, platforms…)
Ability to navigate in virtual spaces
Ability to use digital assistance systems
Awareness of operational IT security
Usage of digital IT for administration (outlook, word, excel, ..)
Error management (interpretation of error messages)
Data protection management (encryption of online connections, password protection…)
Management of networks
Handling of artificial intelligence
Human-machine-interaction
Ability of social-media-application
Management of Big Data
Programming

Social competence refers to a disposition to be able to shape professional social relationships in social professional situations in a self-organized, creative, critical, responsible and goal-oriented manner within an organizational structure on the basis of individual resources - a set of personality traits, school psychological knowledge, skills and attitudes - in accordance with legal and professional ethical standards, by recording, reflecting on, assessing and constructively shaping different interests, attitudes and tensions, as well as rationally, creatively and responsibly communicating and engaging with others. Social competence is particularly evident in contact, communication and cooperation with professional target groups, colleagues, and superiors.

The class of social competence included:

Ability of conflict resolution (conflict management in virtual teams)
Ability to cooperate (sovereignty in digital collaboration, e.g. facebook groups, moodle, forums)
Ability to engage in dialogues Client orientation
Ability to mediate and transmit information for interaction
Adaptability
Communication skills (proficiency in digital language, significance of emojis)
Consultation and counselling ability
Cultural competence
Eagerness to experiment
Integration skills
Interaction skills (ability to process complex information, negotiation skills in virtual teams)
Linguistic ability
Professional commitment
Readiness for understanding
Relationship management (ability to form and maintain social relationships..)
Social commitment
Socio-technical skills
Strong acquisition skills
Team skills
Tolerance
Use of digital networks

Self-competence/personal competence/human competence* is a disposition to be able to act in a self-organized, creative, critical, responsible, and goal-oriented manner within an organizational structure based on school psychological resources – a set of personality traits, school psychological knowledge, skills, and attitudes - in professional situations in relation to oneself. This includes being able to assess oneself, to develop productive attitudes, values, motives and self-images, to develop one's own capacity, to direct one's own actions towards the effective implementation of intentions , plans and goals for oneself and/or others and/or with others in a team, to take responsibility, to integrate one's own emotions, motivations, skills, experiences and competences into one's own knowledge needs, to be willing to learn, to identify, reflect on, assess and further develop professional development opportunities, requirements and limitations.

* These terms are used synonymously in this study following BADER/MÜLLER (2002), who considered neglecting theoretical roots permissible in this case.

The class of personal competence included:

Ability to deal with ambiguity/complexity
Ability to reflect
Ability to take initiatives
Abstract thinking
accountability
Awareness of rules for data protection
Creative will
Creativity
Credibility
Critical thinking
Decisiveness
Discipline
Empathy
Flexibility
Helpfulness
Holistic thinking
Innovativeness
Loyalty
Normative-ethical attitude
Openness to change
Preparedness
Problem solving ability
Professional attitude
Professional commitment
Readiness to execute
Reliability
Resilience
Self-management (self-control, self-reflection, self-organization, self-efficacy, self-discipline, self-reliance, personal responsibility, time management, priority management, health management…)
Willingness to learn

4. THE CONSTRUCT 'DIGITAL COMPETENCE'

4.1. THE CONCEPT OF 'DIGITAL COMPETENCE'

Having already discussed the complications of the definition of "competence", it was no surprise to find the same impracticalities in the definition of DC. The very different DC definitions in political, economic, and scientific documents had equally led to a terminological chaos (GILSTER 1997; ILOMÄKI 2011; ALA-MUTKA 2011; LARRAZ 2013, RUOSS 2015; MURRAY & PÉREZ 2014; FERRARI 2013; EUROPEAN COMMISSION 2013 UND 2018C; JISC 2012; DAVIS, FIDLER & GORBIS 2011).

Based on their literature review PEIFFER et al. (2020) concluded that despite the importance of the DT of today's workplaces, key concepts for the use of digital resources were still insufficiently researched, so that there was no consensus on what DC entailed and what kind of DC was needed in the world of work.

OBERLÄNDER & BEINICKE & BIPP (2020) conducted an extensive literature review on DC in the workplace and concluded in a similar way: *"A thorough analysis of the available literature revealed a lack of scientific research on DC of adults and a neglect of the work context. However, the large variety of terms and proposed frameworks shows the interest in DC in many different contexts, such as education, politics, or media and communication... Furthermore, our results suggest that the concept of DC is multi-faceted and can be based on knowledge, skills, abilities, and other characteristics." (*OBERLÄNDER, BEINICKE & BIPP 2020, p.20)

There was a broad consensus among experts from politics, education, and business to regard DC as an important key competence for lifelong learning and professional competence (ZINKE 2019, p.71). It was regarded as a transversal, interdisciplinary and interprofessional or cross-sectional

competence. According to the European Reference Framework for Lifelong Learning it was to be classified in the rank of a cultural technique, like reading, writing, arithmetic. It was closely related to other cross-occupational key competences:

"*The digital transformation is changing the mix of tasks within existing job profiles and leading to more complex skills profiles for which additional digital qualifications are becoming necessary in almost all industries and professions. Social-communicative and intercultural skills, systemic and creative thinking, the ability to abstract, and the ability to process information and select data quickly are central to success on the labor market.*" (BUNDESMINISTERIUM FUR ARBEIT UND SOZIALES 2017, p. 105, free translation)

The DiCoSP - study assumed that DC consisted of the four competence classes of digital-related school psychological professional, methodological, social, and self-competence, cross-occupational key competence as well as cross-occupational professional DC. Professional DC is understood to include the following four classes: Information and data, media, communication, and technology competence. The following section explains how this understanding of DC came about. Based on their intensive study of the literature on the concept of DC, DA SILVA & BEHAR (2019) concluded that most authors could agree on considering KAS as the basis of DC. DA SILVA & BEHAR (2019) assumed, that the technological changes and complexity caused changes in terminology and needs. They reconstructed the history of related terms such as computational, informational, media and digital literacy/competence as respective responses to current technological challenges. Figure 8 presents the terms used to date around "digital literacy/competence" in its historical development. In the 1980s, there was a need to understand how to use computers. In the early 1990s, the focus was on using information and media.

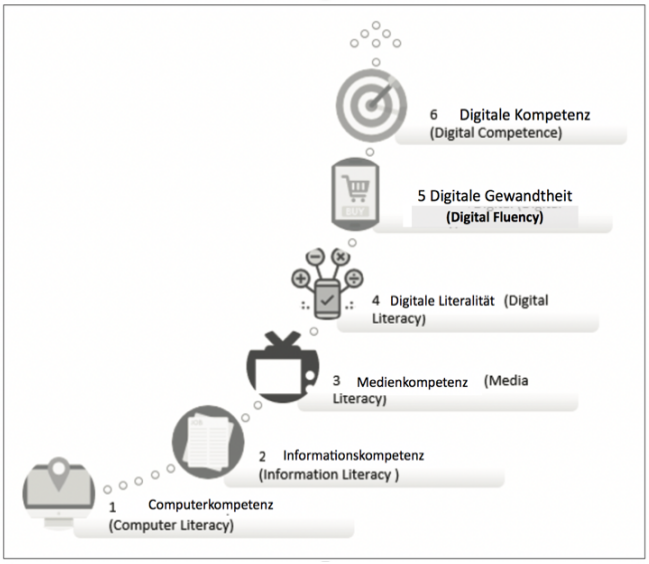


FIGURE 8*: Construction of digital competence concepts according to KELLEN & BEHAR 2019, S.25*

Since 1997, the focus has been on DC in using mobile digital tools and the Internet. Since some authors assumed the historical path as a constitutive element of DC, they conceived DC as the sum of these concepts. Figure 9 shows the result of an empirical analysis by ALA-MUTKA et al. 2011, which visualizes the overlap of the various

competence concepts. ICT competence is the most narrowly defined concept with a focus on technical knowledge and use of computers as well as software applications. Internet competence adds the aspect of successful use of digital network environments to the knowledge and skills for using digital resources. Information competence and media competence overlapped for the most part, with information competence referring more to finding, organizing, and processing information, while media competence focused on interpreting, using, and creating media. This included both digital and non-digital media. Internet competence added the aspect of successfully using digital network environments to the knowledge and skills of using digital resources. DC embodied the broadest concept by incorporating the main aspects of the other concepts and adding further aspects in the form of responsible and effective use of digital resources for one's own tasks and development as well as for personal digital networking.

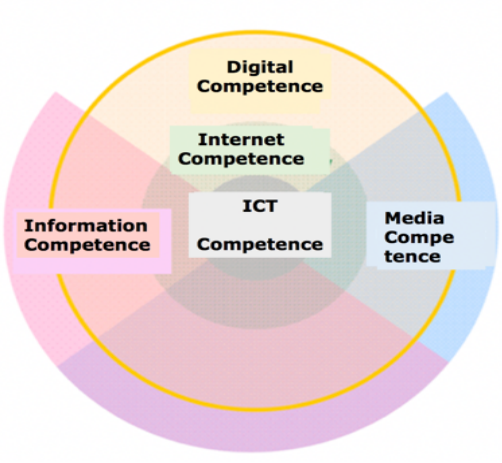


FIGURE 9 *Overlaps of digital-related competence concepts according to ALA-MUTKA (2011, p.30)*

4.2. DIGITAL COMPETENCE MODELS

There have been multiple attempts to operationalize the construct of DC (KNACKSTEDT et al. 2022, JICS 2013). The concepts differed in terms of the model, the definition, the degree of internationalization, the measurement method (knowledge queries, interactive problem solving, scenarios, portfolios) and certificate forms (vendor-specific or -neutral certificates, computer driving licenses such as ICDL-Europe (FRAILLON et al. 2013). There were few national and international scientific studies to understand and develop the notion of DC. Most studies came from international bodies such as the European Commission (FERRARI 2012), OECD (2021) and UNESCO (2018) defining a list of DC for different user profiles. THORDSEN et al. (2019) concluded based on their study on knowledge management in digital environments *"On the research topic of digital competences in occupations, research has been mainly exploratory. A universally applicable digital competence, framework for a larger occupational group has been lacking."* (THORDSEN et al. 2019, p. 32, free translation)

Such a comprehensive profile was also missing for SP in education and in practice and should be developed by this DiCoSP - study. As examples, three models of DC are presented that had an important influence on the development of the DiCoSP digital competence framework for SP.

4.2.1. LARRAZ MODEL

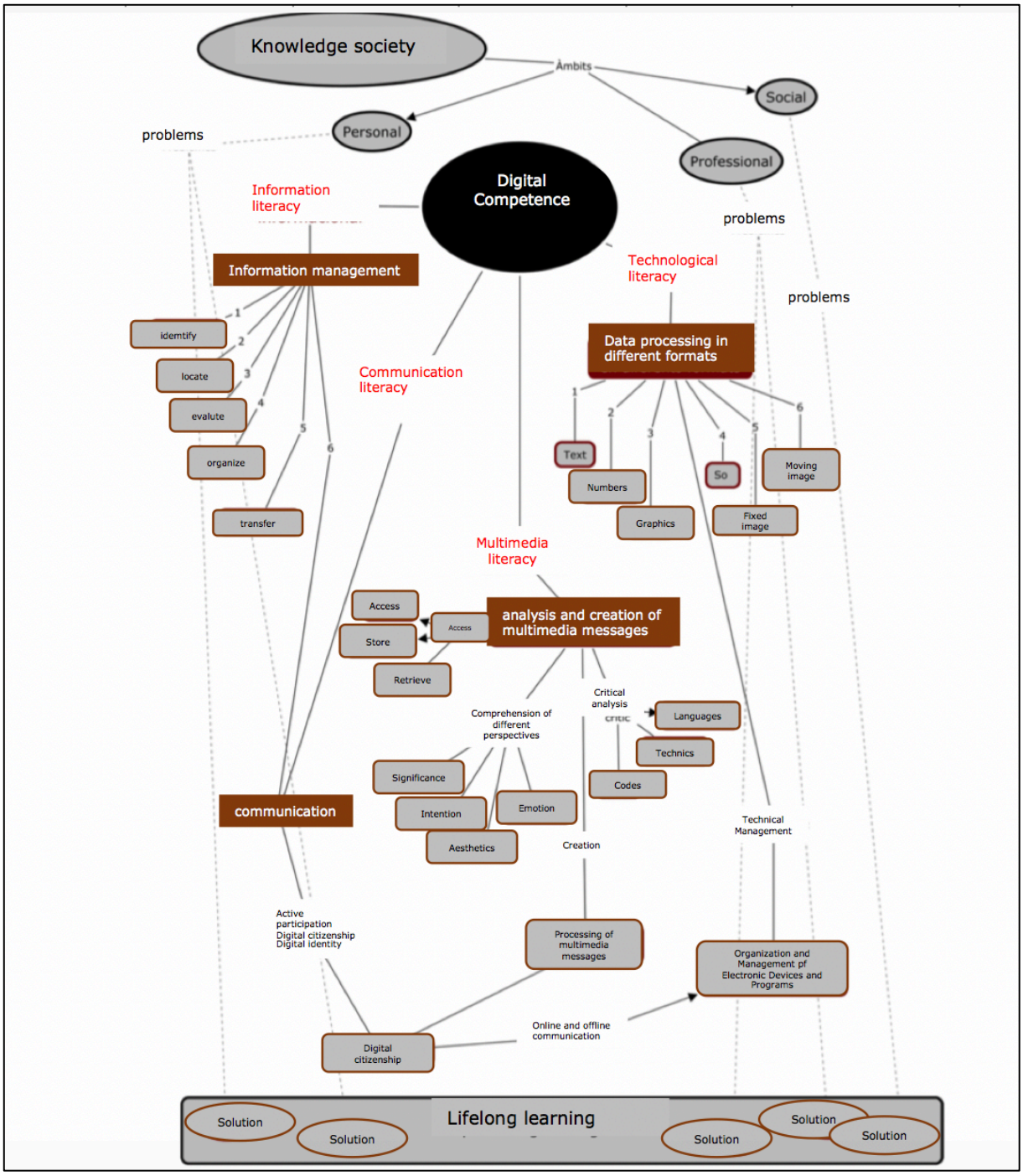


FIGURE 10 *LARRAZ concept of digital competence (2011, p. 119) translated and published with kind permission of the author*

LARRAZ (2013) had conducted one of the few scientific studies on the DC concept. In her dissertation she developed based on her extensive study of DC models a DC training and assessment model mainly for teacher education at universities (LARRAZ 2013, p. 137/8 and p.177). LARRAZ understood DC as *"the ability to mobilize diverse literacies to manage information*

and communicate knowledge for problem solving in a constantly evolving society." (LARRAZ 2013, p.118) Thus, her work was consistent with the assumption that competence is a disposition to act professionally. Her definition of DC is visualized in Figure 10. LARRAZ (2013) concluded, that DC is composed of four literacies: information and data, media, communication, and technology Literacy. She used the term "literacy" to refer to the degree of mastery of knowledge and skills in a given context (LARRAZ 2013, p. 196). She assumed that the European reference framework for DC was compatible with her theoretical foundation of DC.

The DiCoSP - study adopted the result of the LARRAZ research that DC is composed of the basic competence classes information and data, media, communication, and technology competence.

4.2.2. THE EUROPEAN FRAMEWORK FOR DIGITAL COMPETENCE

In 2018, the European Council defined DC as a key competence of lifelong learning. As this definition formed the basis for all digital European reference frameworks, it shall be cited in full length:

„Digital competence involves the confident, critical, and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking.

Essential knowledge, skills and attitudes related to this competence:

Individuals should understand how digital technologies can support communication, creativity, and innovation, and be aware of their opportunities, limitations, effects, and risks. They should understand the general principles, mechanisms and logic underlying evolving digital technologies and know the basic function and use of different devices, software, and networks. Individuals should take a critical approach to the validity, reliability and impact of information and data made available by digital means and be aware of the legal and ethical principles involved in engaging with digital technologies.

Individuals should be able to use digital technologies to support their active citizenship and social inclusion, collaboration with others, and creativity towards personal, social, or commercial goals. Skills include the ability to use, access, filter, evaluate, create, program, and share digital content. Individuals should be able to manage and protect information, content, data, and digital identities, as well as recognize and effectively engage with software, devices, artificial intelligence or robots.

Engagement with digital technologies and content requires a reflective and critical, yet curious, open-minded, and forward-looking attitude to their evolution. It also requires an ethical, safe and responsible approach to the use of these tools." (COUNCIL OF THE EUROPEAN UNION 2018, p. C189/9/10)

This definition has been operationalized in form of the European Reference Framework for DC (DigComp) (CANTERRO GOMEZ et al. 2017). It has become an internationally recognized DC key tool (FERRARI 2012). An extensive UNESCO study (LAW et al. 2018) on DC models concluded that the DigComp was a valuable basis for the development of a global DC framework. The European reference framework had been further developed so that, in addition to the digital competence framework for citizens there was also a version, for consumers, for educators DigCompEdu, for Digitally Competent Educational Organizations, a DigComp at work, and a self-assessment tool. Together, the reference frameworks provided a reference model for promoting DC. In AT, BE, CH and DE the DigComp was a reference framework for national initiatives in DC. In CH and in AT there were nationally elaborated DC frameworks.

In **AUSTRIA** the "Digital Competence Model for Austria - DigComp 2.2 AT" was based on the European reference framework (BUNDESMINISTERIUM FÜR DIGITALISIERUNG UND WIRTSCHAFTSSTANDORT 2021). It consisted of six competence areas, eight competence levels from "basic" to "highly specialized" and 25 sub-competences. The model combined general, vocational training and adult education and was thus also interesting for SPs who were willing to assess or expand their DC.

BELGIUM did not have a national framework of DC. There were isolated concepts, e.g. a template for DC of teachers in the French-speaking community (FÉDÉRATION DE L'ENSEIGNEMENT SECONDAIRE CATHOLIQUE 2014). In the German-speaking Community of Belgium, the school curriculum for information and media competence of students was aligned with the DigComp and EQF (MINISTERIUM DER DEUTSCHSPRACHIGEN GEMEINSCHAFT BELGIENS 2013).

In **SWITZERLAND** the 'Orientation framework for basic competences in information and communication technologies' (SCHWEIZER EIDGENOSSENSCHAFT 2019) was introduced with reference to the 'Digital Switzerland' strategy (SCHWEIZER EIDGENOSSENSCHAFT 2023) and the DigComp. It comprised five competence areas and linked the assigned individual competences with basic DCs named in the Swiss Continued Education Act. The basic DCs corresponded with Switzerland's national policy of 'Basic competences in the workplace'. The orientation framework refers to the use of digital devices and online services, information retrieval and digital communication. Respect for privacy, copyright, data protection and personal health should also be considered. Within the framework of the Continued Education Act, SP could also be promoted in the acquisition of workplace-related digital skills. In Swiss, the European Competence Framework served as the basis for promoting DC in vocational education (SCHWEIZER EIDGENOSSENSCHAFT 2022).

In **GERMANY,** there were several approaches to assessing, defining, and applying basic DC, even if there was not a national digital framework

available. The Standing Conference of the Ministers of Education and Cultural Affairs of the German Länder had defined six digital competence areas as part of their strategy "Education in the Digital World". These areas were in line with the European reference framework (KULTUSMINISTERKONFERENZ 2017). The German government's data strategy (DIE BUNDESREGIERUNG 2021) envisaged various measures for digital skills acquisition. For example, the 'Digital Germany' project pooled current DC competence models and study results. It aimed to create a scientifically sound basis for relating the models via a one single framework concept. The content of the project addressed the needs, competences, and competence requirements of various population groups, as well as the conditions for successful competence acquisition. A model included in this project was the 'Berlin Model of Digital Competence Development as an Additional Qualification', which was based on the "Code®Competence Atlas" by ERPENBECK & HEYSE (2017). DC was understood in this model as **"***competences for living, learning and working under the conditions of digitization. In the true sense of the word, they encompass individual, formal and informal competence development and are aimed at enabling people to act creatively, purposefully and in a self-organized manner in complex, open situations and to do so using new, rapidly developing technologies, above all information and communication technologies*." (RÖHRIG, MIKHEEVA & MICHAILOWA 2018, p.5/6, free translation)

FERRARI, PUNIE, REDECKER (2012) analyzed fifteen DC frameworks. Based on the results they compiled a common structure for the European Reference Framework. This concept corresponded to the building blocks deemed important for the DiCoSP model: KAS as a typology of DC constituents as well as an action-oriented concept of DC in form of the DC modes 'critical, creative, responsible, autonomous, ethical'. The European Framework included five classes of professional DC: information and data competence, communication and collaboration, digital content creation, security, and problem solving, with a total of twenty-one sub-competences at eight competence levels each (FERRARI 2012a/b, 2013, 2013; CARRRETERO GOMEZ u.a.2017, VOUKARI u. a. 2016, 2022). In terms of level formation, the DigComp for Citizenship version 2.0 was based on BLOOM's taxonomy: basic DC corresponded to the cognitive class "remember", intermediate DC to "understand", advanced DC to "apply and evaluate", specialized DC to "creation, synthesis" (CARRETERO et al. 2017, p.13).

As all countries investigated in this study took the European Reference Framework for DC into account and as there was no universally accepted definition of DC, the development of the DiCoSP competence framework for SP was guided by this DigComp model:

In the DiCoSP - model, the constituent elements of DC were arranged according to KAS. The sub-competences of the DigComp were considered according to the categorization of LARRAZ: Information and Data

Competence (IDC), Technology Competence (TC) = Security and Problem Solving in DigComp, Media Competence (MC) = Digital Content Creation in DigComp, Communication Competence (CC)= Communication and Collaboration in DigComp. These DC classes were summarized in the DiCoSP structure as **"professional digital competence"** and considered to be a part of the SP's DC. Detailed information can be found in APPENDIX 3.

For the DiCoSP study, it was interesting to note that on a European level, DC concepts considered not only ICT-related knowledge but also other transversal key competences. For the authors of DigComp, DC was more than the ability to use hardware and software. " *In our opinion, having technical skills at the core of a Digital Competence model does not give enough importance to other equally relevant aspects. Digital Competence should be understood, in its wider sense, as a multi-faceted concept.*" (FERRARI 2012b, p.43).

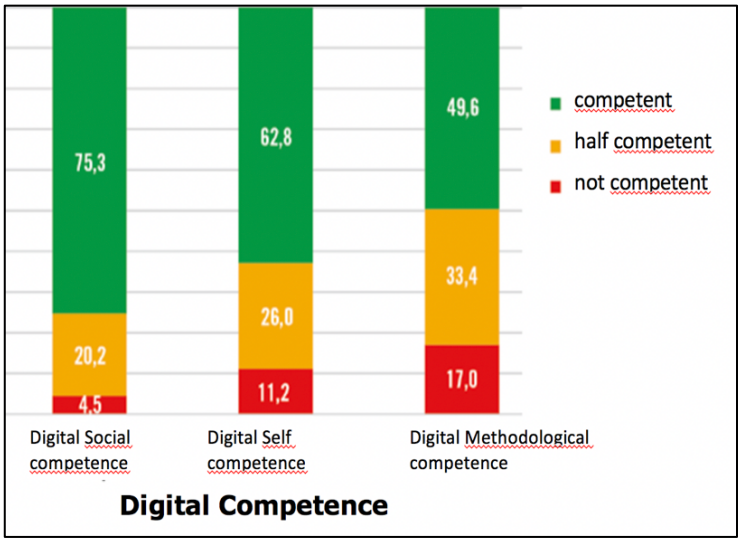


FIGURE 11 *Characterization of DC with the three factors of digital personal competence, social competence, and professional competence. Source: PRÜMER (2017, p.19)*

Accordingly, ICT related digital competence was important, but not sufficient to meet the DC requirements in a school psychology work environment. The DiCoSP study followed the holistic understanding of DC in the sense of the Frankfurt triangle (WEICH 2019) and ERPENBECK. They suggested to consider in self organized and creative remote work not only the safe and reflective use of digital resources, but also professional, social, and personal knowledge, skills, and attitudes. These aspects were represented in the DiCoSP model by the PMSP classes. This position was supported, a. o., by the PRÜMPER study (2017). He analyzed the role of competence classes in remote work settings according to the PMSP classes (Figure 11). The results showed that most surveyed employees had sufficient digital social and personal competence, while half of the respondents rated their professional digital competence as mediocre or low. Such a structure was found to be useful to determine professional DC profiles and DC training needs.

DEHNBOSTEL (2021) assumed that at least two reference points should be considered in a digital competence framework:

1. The dimensioning in professional, methodical, social, self-competence (PMSP) as well as their bases KAS.
2. The European Reference Framework for DC (DigComp for Citizens).

This assumption was supported by the conclusion from SILVA & BEHAR's (2019) analysis of different DC concepts that KAS is a typology of the DC definition capable of consensus.

The DICOSP competence framework was also based on the results of the SKILL-IT research study, which, in reference to the P21 goals, developed a classification of five European Reference Framework dimensions of DC according to knowledge, skills, attitudes and behavior. However, the category 'behavior' of the Skill-IT study was assigned to the category "skills" in the DICOSP - model to correspond to the theoretical foundation of the KAS typology according to WINTERTON, DELAMARE-LE DEIST and STRINGFELLOW (2006).

These considerations led the DiCoSP - study to the proposal that competence and digital competence is a synthesis of the competence classes PMSP, each to be categorized into KAS.

4.2.3. GENNER DIGITAL COMPETENCE MODEL

The competence structure model of GENNER (2020) included DC as a "cross-competence" to the PMSP – competence classes and thus takes up both the triad according to ROTH and the understanding of DC as a transversal key competence (Figure 12). After an analysis of 26 models, GENNER developed an understanding of competence based on value concepts. She leaned on SELIGMAN's concept of character strengths (SELIGMANN 20122). Values were also relevant in ERPENBECK's competence model: *"Competences are founded by knowledge, constituted by values, disposed as abilities, consolidated by experience, realized on the basis of will."* (HEYSE 2017, p.246 free translation)

Why should ethical values be considered in a digital framework of school psychology practice? The integrative social contracts theory (ISCT) by DONALDSON und DUNFEE (2008) provided a detailed orientation for the relation between values and competences.

FIGURE 12 *GENNER DC MODEL 2019, p.13*

Norms represented a binding moral framework for common values of an organization/professional group. ISCT assumed different levels of ethics in a community. Microsocial norms represented the established moral commitment of members of a community, as professional codes of ethics in (school) psychology, e. g. EFPA's ethical MetaCode. These norms needed to be consistent with hyper-norms based on universal guidelines such as the European Convention on human rights or the UN - Convention on the Rights of the Child. According to ISCT, in the case where there were no binding norms, managers of an organization had moral discretion in deciding how to respond to requirements, e. g. preference to invest in technological skills.

The Covid-19 pandemic required remote school psychology practice. In terms of DC in practical SP, there was a regulatory gap of normative guidelines in professional use of digital technology in the studied countries. Non-legal norms were not sufficient and legal norms were too general to adapt the rules to the new reality and to serve as a guideline. The inadequate normative framework required revising and updating current norms in school psychology. The design of ethical frameworks was seen as a way to address societal and professional problems caused by digitalization (NEWMAN et al. 2019, PORTER & STERN 2015).

DICOSP followed GENNER's model by integrating DC into PMSP classes. However, DiCoSP differed in the accentuation of integration. GENNER saw DC as an appendage of competence classes:

"Digital competences complement these three areas with specific aspects added by digital technologies...Digital competences are understood here as a kind of contemporary "update" of the three major pillars." (GENNER 2019, pS.13, free translation)

DiCoSP did not see DC as an update, but as an added value, as an agent of professional cultural change. In this respect, DiCoSP did not add elements of DC to the PMSP classes, but rather aligned the competence classes to a comprehensive understanding of DC. Since DiCoSP also made a taxonomic classification of the competence classes according to KAS, it was possible to integrate the basic values listed separately in GENNER's framework into the DiSoCP framework under "attitude".

4.3. SUMMARY

DiCoSP assumed that

- DC is based on knowledge, skills, and attitudes (KAS), whereas values are having an important place due to the profession of SP with an ethical responsibility in the professional application of digital resources,
- DC is composed of the classical four PMSP classes,
- Data and information, technological, media and communication competence are the basic classes of professional DC,
- DC in school psychology is closely linked to transversal key competences and professional DC
- DC is a disposition to act in a digital-related context,
- the DigComp is a model for the construction of the DiCoSP competence framework because it is
  - compatible with an action-theoretical DC concept,
  - sufficiently theoretically underpinned regarding the professional digital competence classes information and data, communication, technological and media competence,
  - referring to KAS as bases of competence,
  - applicable across countries, educational and labor sectors,
  - possible to relate it to profession-specific competences.

4.4. CONCLUSION

The reflections on the concept of competence and digital competence led to the proposal that DC in school psychology practice consists of three structural levels:

1.SCHOOL PSYCHOLOGICAL DIGITAL COMPETENCE IN PRACTICE: School psychological digital competence is consisting of the classes of digital-related professional, methodological, social, and personal competence. Each digital-related competence class is composed of a synthesis of school psychological competences, digital professional competences, and key competences. (APPENDIX 4).

2.TRANSVERSAL PROFESSIONAL DIGITAL COMPETENCE: Competence in the use of digital resources is consisting of the classes information and data competence, media, communication, and technology competence (APPENDIX 3).

3. TRANSVERSAL KEY COMPETENCE: Competence to cope with the labor world in digital transformation, such as agility, creativity (APPENDIX 5).

In the architectural model according to ROE (2002) DC is seen as a sub-competence of school psychological competence. DiCoSP agrees with this order. Due to the focus on DC, a specification is needed of the relevant intersection of DC with school psychological competence for coping with digitally related professional situations (digitally related professional, methodological, social, and personal competence), with transversal key competences and transversal professional DC. As this is a new way of looking at profession-specific DC, the structure will be explained in details.

4.4.1. PROFESSIONAL DIGITAL COMPETENCE

Professional DC refers to the four basic competence classes of information and data competence, media, communication, and technology competence. This competence results from the use of digital resources, not from a specific professional context. It is about the 'digital toolbox', such as knowledge, handling and application of hardware and software, technical problem solving in dealing with digital resources. The terms should be understood as follows (APPENDIX 3):

Professional digital competence is a disposition to be able to use digital resources in a self-organized, creative, reflective, responsible, and goal-oriented manner based on individual resources - a set of personality traits, knowledge, skills, and attitudes - while considering applicable ethical and legal standards.

Professional digital media competence is a disposition to be able to know, select, access and use digital media in a self-organized, creative, reflective, responsible and goal-oriented manner, based on individual resources - a set of personality traits, knowledge, skills and attitudes - to understand and evaluate the various aspects of digital media and media content, and to develop and design digital media in a variety of contexts, to express oneself by means of digital media and to communicate, taking

into account applicable ethical and legal standards (BAAKE (1996), THOMAN & JOLLS (2003), GAPSKI (2009), BRANDTWEINER, DONAT & KERSCHBAUN (2010), TULODZIECKI (2011), SCHORB (2017)).

Professional digital information and data competence is a disposition to be able to assess the need for digital data and information in a self-organized, creative, reflective, responsible and goal-oriented manner on the basis of individual resources - a set of personality traits, knowledge, skills and attitudes - to locate, access, navigate between, evaluate, use, process, and manage digital data and information as needed, and to communicate and integrate them into a set of knowledge, taking into account applicable ethical and legal standards (VAN DIJK (2012), DÖRGE 2015 , LEICHNER 2015, SCHÖNBRODT et al. 2016 , BMBWF 2018, SCHÜLLER et al. 2021).

Professional digital communication competence is a disposition to be able to know, select, evaluate, and use digital resources for communication and collaboration in a self-organized, creative, reflective, responsible, and goal-oriented manner, based on individual resources - a set of personality traits, knowledge, skills, abilities, and attitudes - while taking ethical and legal standards into account (DÖRING 2003, GRIMM & DELFMANN 2017, BAUER & MÜßLE 2020, DÖRING 2022).

Professional digital technology competence is a disposition, to be able to master the use of digital resources technically on the basis of individual resources – a set of personality traits, knowledge, skills and attitudes - in a self-organized, creative, reflective, responsible and goal-oriented manner under aspects of functionality, safety and health, to find solutions to problems due to the use of digital resources, to assess the need for digital technology to solve professional challenges and to be able to contribute to solutions taking into account ethical and legal standards (SCHMIDT-HERTA 2014, STEMMANN 2016, TERRA 2022).

4.4.2. DIGITAL COMPETENCE IN SCHOOL PSYCHOLOGY PRACTICE

DiCoSP proposed the following definition of DC in school psychology practice based on the conditions described:

Digital competence in school psychology practice is a disposition to be able to act in digitally related professional situations in a self-organized, creative, critical, responsible, and goal-oriented manner based on individual resources - a set of personality traits, digitally related knowledge, skills, and attitudes - within an organizational structure. Digital competence consists of the competence classes digital-related school psychological professional competence, methodological competence, social competence, and personal competence. Each digital-related competence class is a synthesis of transversal key competence and transversal professional digital competence, consisting of the competence classes digital data and information, media, communication, and technology competence.

Digital-related professional competence is a disposition to be able to act in a self-organized, creative, critical, responsible, and goal-oriented manner within an organizational structure based on school psychological resources – a set of personality traits, school psychological knowledge, skills, and attitudes - in professional situations with a digital context.

Digital methodological competence is a disposition to be able to act in a self-organized, creative, critical, responsible and goal-oriented manner within an organizational structure on the basis of school psychological resources - a set of

personality traits, school psychological knowledge, skills and attitudes - in professional digital-related situations with methodological requirements, to structure the work process and to select, apply and evaluate digital solution strategies independently, appropriately and in accordance with the situation, as well as to further develop methods.

Digital social competence refers to a disposition to be able to shape professional social relationships in the digital space in a self-organized, creative, critical, responsible and goal-oriented manner within an organizational structure on the basis of SP resources – a set of personality traits, SP knowledge, skills and attitudes - in accordance with legal and professional ethical standards, by recording, reflecting on, assessing and constructively shaping different interests, attitudes and tensions, and by communicating and engaging with others. Digital social competence is particularly evident in digital communication, interaction, collaboration and networking with target persons/groups, colleagues, and superiors of SP.

Digital-related self-competence/personal competence/human competence*is a disposition to be able to act in a self-organized, creative, critical, responsible, and goal-oriented manner within an organizational structure based on individual resources – a set of personality traits, educational psychological knowledge, skills, and attitudes - in professional situations in relation to oneself. This includes being able to assess oneself, to develop productive attitudes, values, motives and self-images in the digital context, to develop one's own digital performance capacity, to direct one's own digital actions towards the effective implementation of intentions, plans and goals for oneself and/or others and/or with others in a team, to assume responsibility, to integrate one's own emotions, motivations, skills, experiences and competences in the digital context into one's own knowledge needs, to be ready to learn digitally, to grasp, reflect on, assess and further develop professional development opportunities, requirements and constraints in the digital context.

* These terms are used synonymously in this study following BADER/MÜLLER (2002), who considered such a use permissible neglecting theoretical roots.

An example illustrates the model: Attending a training course on cyberbullying prevention, a SP got to know the „Cyber-Mobbing First-Aid App" and wants to use it in a school class.

The application of the cyberbullying - APP requires school psychological competence in the form of knowledge, skills, and attitudes regarding bullying/violence prevention. The new knowledge and application of the APP can be categorized as "profession-specific digital-related methodological competence - knowledge (MCK) and skills (MCS) - in the area of media competence (MEC = digital professional competence)". This in turn can be an expression of the transversal key competence "adaptability" or "client orientation", as the SP considers digital needs of young people.

The SP's interest in the topic can also be categorized as "profession-specific digital-related methodological competence - knowledge (MCK) and skills (MCS) in the area of technological competence (TC)". The focus here is on a preventive solution to risks for the development of young people of using digital resources, which in turn can be an expression of, for example, the key competence "Analytical skills" or "Problem-solving skills".

The SP's participation in DC training related to violence prevention can also be categorized as " personal competence - attitude ‘willingness to keep one's own competence up to date" (= job-specific digital-related personal competence – PCA) or as "personal competence - skills - updating and developing one's own digital competence" (PCS) in each case in technological competence (professional digital competence). At the same time, participation relates to the key competence "willingness to learn".

Thus, the assignments were not carved in stone, but could be flexibly adapted to the KAS typology of PMSP classes depending on the objectives. This was a disadvantage of the model if a precise assignment of KAS and DC to professional acts was required, e.g. when it is a matter of basic research to figure out which prerequisites of KAS should be promoted in education to achieve digitally related professional competence. On the other hand the model offered a great flexibility for users because the KAS could easily be matched to nearly all professional situations. E.g. it was possible to compile suitable digital competence profiles in the context of personnel planning or organizational planning. The model also allowed for a flexible adaptation to the impact of technological innovation by adding or eliminating competences according to the needs development.

5. COMPETENCE MODELS

5.1. INTRODUCTION

Since competence models systematize and operationalize the understanding of competences and provide a framework for their curricular implementation, the development of a needs-based DC model in school psychology practice required an overview of necessary professional DC and its foundations:

- Which KAS of DC are required?
- Which professional requirements are to be met with the help of KAS?

ROE (2002) pointed out the importance of updated competence profiles in the trainings of psychologists: *" A third way is to update the existing competence profile or establish an additional specialized competence profile, to describe and analyze the content of the work and the demands posed by it. This would seem useful in cases in which a new specialty is developing, such as in the psychology of drug addiction or the psychology of knowledge work. In this case one would compare the required and present qualifications and build up the training in a manner that bridges the gap."* (ROE 2002, p.200)

According to ROE (2002), the creation of a professional competence profile involved the following steps:

1. Occupational or job analysis: gathering information on the roles, tasks, and duties to be performed in a particular job;
2. Competence analysis: defining the required competences together with the associated forms of KAS, and the underlying dispositions, i.e. personality traits;
3. Competence modeling: creating a model that shows the relationships between specific competences and relevant KAS and dispositions, e.g. in the statistical form of the regression model;
4. Testing the competence model: assessing the validity of the model and determining the parameters of the variables that contribute to or predict competencies.

The first two steps could be performed using conventional job and task analysis methods. In practice, the judgment of professionals was often accepted as a sufficient basis for the creation of a competence profile. The latter two steps could be seen as refining and empirically substantiating the competence profile. In this study, step 1 and 2 were considered to develop a DC framework for SP in practice, so that step 3 and 4 should be carried out in a follow-up study.

Currently, two forms of competence models were distinguished (KOBAYASHI 2002, HARTIG & KLIEME 2006). "Competence structure models" map competences "horizontally" by using sub-dimensions to describe areas of competence. "Competence *structure models focus [...] on how coping strategies with different requirements are interrelated and which and how many dimensions are needed to describe adequately interindividual competence differences." (*KLIEME & MAAG-MERKI & HARTIG 2007, p.11, free translation)

Differentiation, administration, and evaluation of the various competence dimensions formed the core of these models. A competence model according to WILBERS (2018) served "*…to structure competences according to dimensions, level, scope, area and domain"* (WILBERS 2018, S.68). Competence levels formulated the degree of mastery of a competence dimension, e.g. beginner, advanced, expert. In the professional practice, structural models were predominantly available with a superordinate objective, usually competence to act professionally, being divided into different sub-dimensions. The models were mostly developed across professions to be able to project a general model of competences onto a specific occupation field. An example of a competence structure model was the 'European Reference Framework for Digital Competences' (CARRETERO GOMEZ u.a..2017) and the 'Code® Competence Atlas' (HEYSE 2017).

"Competence development models" viewed competences as a learning and development process and mapped competences "vertically", i.e. the course of competence acquisition in a specific area and context. The focus

was on specific tasks that could be assigned to a level and mark the state of competence acquisition. An example of this was the Dreyfus model (DREYFUS, DREYFUS 1980), a 5-level model of mental activities in skill acquisition. Since this study was concerned with the dimensioning of DC in the profession of school psychology, a competence structure model was proposed in the DiCoSP study.

The value of theoretical models for psychological practice, especially the aspect of competence assessments, had often been discussed (FOUAD et al. 2009, HUNSLEY, BARKER 2011 and 2013, BARLOW 2012). Competence assessments assumed that there were theoretically and empirically supported competence models providing a differentiated understanding of the acquisition, development, assessment, and promotion of domain-specific competences. With such a model, ideally, the specific DC of SP could be described in a criterion-oriented way in the form of concrete requirements. Profiles defined in this way made it possible to determine what SPs needed to develop regarding aspects of DC.

A criticism of competence models has been that lists of competences did not provide information about how the various individual competences relate to each other. In addition to necessary prerequisites for practicing a psychological profession, a competence framework should also clarify how the combination of the various prerequisites contributed to the successful practice of the profession (VON TREUE, REYNOLD 2017, p.2; FRANKE 2005).

The possibilities of creating a precisely structured digital competence profile of SP's were limited because there was no generally accepted definition of the domain of school psychology and of a professional profile. ROE critically noted, *"While there are some published studies about the dispositions psychologists should possess and the knowledge and skills they should have, the available evidence is far from sufficient to draw up complete competence profiles of the psychological profession."* (ROE 2002, p.197)

To date, there was no evidence-based professional competence profile of SPs. Perhaps there never will be one, because school psychological work as an applied science is time-, place-, culture- and situation-bound, so that there cannot be "the one and only" school psychology profile, but diverse profiles, which in turn need a diversity of various competences. Also MÜLLER et al. (2021) came to a similar opinion in their study on school psychological services *"A particular characteristic of SP is its multifaceted nature."* (MÜLLER et al. 2021)

Only two legally binding competence profiles for SPs were found in Europe, which both did not address explicitly DC of SP: a competence profile of SPs in the French national educational system (MINISTÈRE DE L'EDUCATION NATIONALE, DE LA JEUNESSE ET DES SPORTS 2017) and in Luxembourg, for staff including SPs in secondary school support and

guidance services (CePAS/SePAS) (MINISTÈRE DE L'ÉDUCATION NATIONALE, DE L'ENFANCE ET DE LA JEUNESSE 2018).

To compensate for the lack of an evidence-based professional competence profile of the SP in AT, BE, CH, and DE, the DiCoSP study reviewed, analyzed, and 'converged' several competence descriptions and models as well as professional profiles of SP as a basis for the development of a digital competence framework:

- Competence requirement in education and training: the European Qualifications Framework EQF (COUNCIL OF THE EUROPEAN UNION 2008), the Tuning EuroPsy Model (GONZALES FERRERAS, WAGENAAR et al. 2011), European Reference Framework for Lifelong Learning (COUNCIL OF THE EUROPEAN UNION 2008), University of Basel (UNIVERSITÄT of BASEL): Doctorate School Psychology, MAS School Psychology University of Zürich, Master's program in School Psychology of the University of Tübingen (UNIVERSITÄT TÜBINGEN 2021, EBERHARD-KARL-UNIVERSITÄT TÜBINGEN 2020 a,b)
- Models of professional competence: EFPA EuroPsy model (2021a), Model of Core Competences in Professional Psychology for Professional Psychologists by IAAP (2016) and IUPsyS, CODE® - Competence Atlas (HEYSE 2017)
- Digital competence models: a.o. European Reference Framework for digital competences of citizens (CARRETERO GOMEZ, VUORIKARI, PUNIE 2017; VUORIKARI, PUNIE, CARRETERO, VAN DEN BRANDE 2016), DigComp 2.2. AT, DigCompEdu (REDECKER, PUNIE 2017), DigCompOrg, Van LAAR u.a. (2017), OBERLÄNDER et al. (2019), LARRAZ (2013), GENNER (2017), BEISSWENGER et al.(2020)
- Educational and Professional Models for SP: ISPA (2017) Skills Model/ CANMED - Seven Professional Roles Model, ISPA (2016) Standards for Accrediting Professional Preparation Programs in School Psychology
- Professional profiles for SPs (a detailed list can be found in APPENDIX 6).

These 'templates' represented the foundation of the school psychological digital competence framework. They helped to define the work fields of SP and to relate the work fields with the subjective side of the DiCoSP MATRIX in form of PMSP competence classes.
Because only the first two steps of a competence profiling according to ROE were subject of this study, the DICOSP - competence framework could not provide information on how the combination of different KAS contributed to a successful DC acquisition. In this study a DC structure in school psychology practice could only be operationalized by lists of KAS, which need to be further developed in follow-up studies into an evidence based DC competence profile.

5.2. EUROPEAN QUALIFICATIONS FRAMEWORK FOR LIFELONG LEARNING (EQR)

5.2.1. INTRODUCTION

The European Qualifications Framework for lifelong learning (EQF) (COUNCIL OF THE EUROPEAN UNION 2008) represented an instrument based on learning outcomes (output orientation), to

- achieve harmonized national frameworks for lifelong learning throughout Europe and to establish comparability of acquired qualifications between EU member states;
- bridge the gap between separate frameworks for general school education, vocational education, and higher education;
- form synergies between formal education and informal learning to develop professional competences (ANNEN 2012).

The EQF was a complementary approach to the Framework for Qualifications of the European Higher Education Area (QF EHEA), the EU Framework of Reference for Education and Training 2010 (COUNCIL OF TH EUROPEAN UNION 2004) and the European Directive on the Recognition of Professional Qualifications (COUNCIL OF TH EUROPEAN UNION 2005).

It was implemented nationally in all countries investigated in this study. Educational definition clusters of the concept of competence in AT, BE, CH, DE established references to the EQF, so that this instrument could be considered as an important reference model in the development of a digital competence framework for school psychology practice. It influenced education, training, and recognition of professional qualifications of SPs across Europe and supported the development of DC (COUNCIL OF TH EUROPEAN UNION 2017).

The EQF comprised a matrix with descriptions of knowledge, skills, and competences at 8 levels. It is a qualification framework based on cognitive theory rather than a competence framework. It understood competence as "*… the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy.*" (COUNCIL OF THE EUROPEAN UNION 2008, Annex I, p.C111/4)

Competence was described in the sense of assuming responsibility and autonomy, likewise in ROTH's publications (1971). In the EQF, the terms 'qualification' and 'competence' were used intersectingly, synonymously, and delimitatively. Competence was not understood as an educational goal, but as a learning outcome among many others. *"Learning outcomes are consequently always more comprehensive than competences and not the reverse."* (EUOPEAN COMMISSION 2008, p.6)

Learning outcomes - formulated by teachers - defined what learners know, understand, and can do after completing a formal, non-formal or informal learning process (WAGENAAR et al. 2008). The definition of learning outcomes in the EQF has been widely discussed (CEDEFOP 2018) and criticized. It did not contribute to the clarification of the competence concept, although the EQF had a decisive influence on the recognition of professional qualifications in Europe, as the referencing of the profession "Clinical Psycholog:In" in Austria showed (p.25).

One hurdle was the diversity of languages. While the English term "learning outcomes" included both "learning outcome" and "learning output" (BOHLINGER 2006), there was no such differentiation in German. Learning outcome" was understood as the observable result of the learning process. In English, "learning outcome" was a learning goal definition that described both the content and behavioral aspects of the learning outcome in a holistic action (learning outcome + learning output). It emphasized the emergence of the outcome in the learning process.

The action-theoretical concept of competence contradicted this EQF competence concept because competence was regarded as a target structure of learning and not as the result of an externally determined learning process to solve assessment, didactic or recognition issues (REIS 2018). DiCoSP agreed with the action-theoretical concept and saw DC not as a learning outcome in the sense of the EQF, but as the goal of a learning process. The EQF showed the tension between the different directions in Europe in the understanding of competence. A common definition of 'competence' among the EU member states was still pending:

"*The term 'competences' as used in the context of learning outcomes descriptors in the third column of the EQF descriptors of Annex II to the 2008 EQF Recommendation is limited to meaning 'autonomy and responsibility'. This is inconsistent with the overarching definition of competence as widely used in European education and training policies, as formulated in Annex I to the 2008 EQF Recommendation: 'the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development'.*" (EUROPEAN COMMISSION 2016, p.4)

The EQF qualifications frameworks implemented nationally reflected this inconsistency.

5.2.2. EQR IN AT, BE, CH, DE

The Qualifications Framework in the German-speaking Community of **Belgium** (QDG) for the field of vocational education and training comprised the two competence categories of professional competence (knowledge and skills) and personal competence (social competence and autonomy), each with 8 levels.

The **German** Qualifications Framework (DQR) enabled the assignment in the field of general education, higher education, vocational education including continuing education to the 8 levels of the EQF based on learning outcomes. The DQR and the competence model of vocational education in Germany as implementation of the EU Reference Framework for Education and Training 2010 included the dimensions: Professional competence subdivided into knowledge and skills, and personal competence subdivided into social competence and self-competence. The DQR was a mixture of competence requirements and classical input-oriented, elaborate knowledge objectives.

The competence structure model of HENSGE, LORIG and SCHREIBER (2009a,2009c) (Figure 13) in the form of a matrix was developed as part of a comprehensive research project to analyze, describe, and systematize action - oriented competence in vocational training programs based on the DQR. It used the four dimensions 'PMSP' as the subject-related side of competence and related them to the object-related competence side in the form of vocational action fields (SLOANE, DILGER 2005). This model was found to be the most suitable template for the construction of the DiCoSP - competence model because it was so general that it

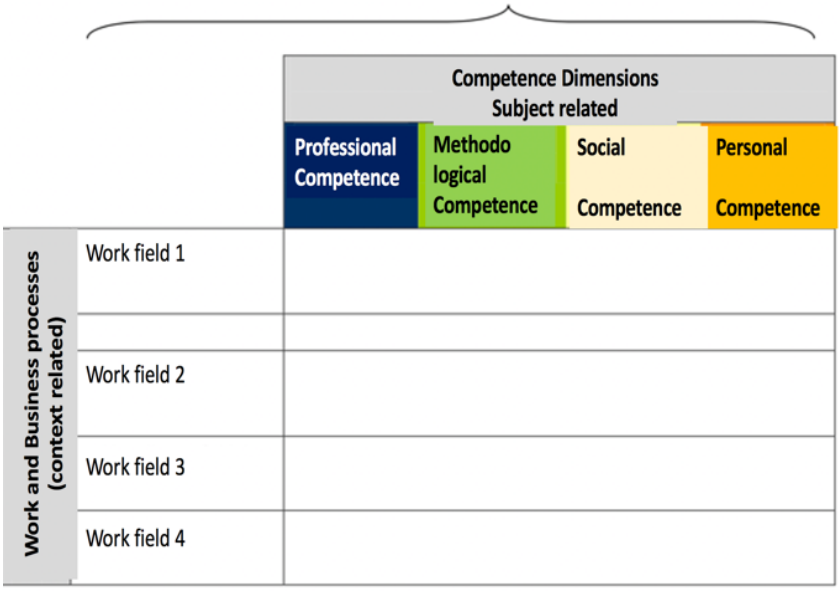


FIGURE 13 *Competence model for vocational training regulations, Source: HENSGE, LORIG and SCHREIBER (2009)*

- could be adapted to any occupation and any country,
- took the competence classes PMSP into account,
- allowed the integration of both occupation-specific and cross-occupation competences,
- was based on an action-theoretical concept of competence,
- was a theoretically sound result of intensive research.

Since the DiCoSP definition of competence included that the fundamentals of KAS were constituent elements, the HENSGE model was extended to include these categories per competence class. This basic structure formed the DiCoSP Matrix of DC in school psychology practice (Figure 14):

PROFESSIONAL WORKFIELD		DIGITAL COMPETENCE											
		PROFESSIONAL COMPETENCE Data and Information-, Communication-, Media-, Technological Competence Key Competences			METHODOLOGICAL COMPETENCE Data and Information-, Communication-, Media-, Technological Competence Key Competences			SOCIAL COMPETENCE Data and Information-, Communication-, Media-, Technological Competence Key Competences			PERSONAL COMPETENCE Data and Information-, Communication-, Media-, Technological Competence Key Competences		
		Knowledge	Skills	Attitude	Knowledge	Skills	Attitude	Knowledge	Skills	Attitude	Knowledge	Skills	Attitude
PREVENTION AND INTERVENTION	COUNSELING,SUPPORT, GUIDANCE, PROMOTION												
	PSYCHOEDUCATION, TRAINING , PUBLIC INFORMATION												
	TREATMENT/ THERAPY												
	CRISIS INTERVENTION												
ASSESSMENT, EVALUATION	ASSESSMENTS												
	TESTING												
	DECISION MAKING, REPORTING												
	EVALUATION, MONITORING												
	SCIENTIFIC PRACTICE												
ADMINISTRATION, PROFESSIONAL DEVELOPMENT	ADMINISTRATION												
	LIFELONG LEARNING, CONTINUED PROF DEVELOPMENT												
	PROFESSIONAL COLLABORATION/ NETWORKING												
	WORK ORIENTATION (INDIVIDUAL ORGANIZATIONAL)												

FIGURE 14 MATRIX OF DIGITAL COMPETENCE IN SCHOOL PSYCHOLOGICAL PRACTICE

In the National Quality Framework **AT** (NQF), competence was described in terms of assuming responsibility and autonomy and a classification into knowledge, skills, competence was made.

In **CH** there was a comparable NQF for VET qualifications with the categories knowledge, skills, competences. The category 'competences' was divided into professional and personal competences. Personal competences were composed of personal competences and social competences. For a more detailed description of occupational competences according to the NQF, there was a grid, which categorized occupational competences (subject-related competences) according to professional action fields (occupational requirements) at eight levels. The following categorizations were used for professional competence in vocational trainings:

PROFESSIONAL COMPETENCE TO ACT IN VOCATIONAL TRAININGS IN CH			
Professional Competence	**Methodological Competence**	**Social Competence**	**Personal Competence**
Expertise	Solving tasks and problems	Design of cooperation and management tasks	Assumption of responsibility
General education	Use of work techniques, methods, and tools	Communication design	Dealing with change
Recognizing connections	Assessing results		Reflecting the action

This classification was close to a competence understanding of self-organization. DiCoSP nevertheless preferred the competence model of HENSGE, LORIG and SCHREIBER (2009 a, c) as a template for the digital competence framework of SP because it was more general than the Swiss model and thus could integrate the Swiss model.

5.2.3. EQR AND REGULATIONS IN TRAINING AND PROFESSION

The EQF could comprehensively represent all types and levels of qualifications in Europe, which could be accessed via a register of qualifications databases. The database of regulated professions of the EU - Commission provided information on whether or how the psychology profession was regulated in the EU member states and in Switzerland. Professional regulations were legally binding when included in this register.

At present, the profession of school psychologists was not regulated, but the profession of psychologists and some specializations were regulated in AT, BE, Croatia, Czech Republic, Denmark, Finland, Greece, CH, and Hungary. In these countries the required professional competences of psychologists were regulated by law. In BE and in CH the professional title "Psychologist" was regulated, in BE additionally "Clinical Psychologist", in AT the professional title "Health Psychologist" and "Clinical Psychologist" according to the European Directive on the recognition of professional qualifications (2005). An example of this referencing is the competence description for the qualification as Clinical Psychologist in Austria (p.25). No explicit reference to DC was made in the qualification descriptions.

The referencing in clinical psychology was of interest in this study, because many SP in AT, BE, DE, CH have a university degree as clinical psychologist. Currently, in the four countries studied, only the University of Tübingen (DE) offered a study program in school psychology leading to a master's degree. The University of Zurich offered irregularly a postgraduate training MAS in School Psychology and the University of Basel offered a doctorate in school psychology. In Belgium only the

Flemish Community offered a master's degree in School Psychology at the Catholic University of Leuven until 2020. Since then school psychology was integrated in the program of clinical psychology due to legislative changes of Belgian health professions.

The multilingual European classification system for skills, competences, qualifications, and occupations (ESCO) helped to compare professional qualifications of various countries. The profession "Educational Psychologist" was classified in ESCO as follows with a description of knowledge, skills, and competences, whereby the terms skills and competences are used rather synonymously:

" Educational psychologists are psychologists employed by educational institutions to provide psychological and emotional support to students in need. They are specialized in the provision of direct support and interventions to students, conducting psychological testing and assessment, and consulting with families, teachers, and other school-based student support professionals, such as school social workers and educational counsellors, about the students. They may also work with the school administration to improve practical support strategies in order to improve the students' well-being."

Basic knowledge	○ *Developmental Psychology* ○ *Crisis intervention* ○ *Psychology* ○ *Psychological counseling methods* ○ *School Psychology* ○ *Psychological development of adolescents*
Basic skills and competences	○ *Perform education testing* ○ *Apply crisis intervention* ○ *Assess school problems* ○ *Student counseling* ○ *Observing the behavior of students* ○ *Test behavior patterns* ○ *Test emotional patterns* ○ *Active listening* ○ *Consult the personal environment of students* ○ *Communicate with young people* ○ *Cooperate with the teaching staff* ○ *Collaborate with educational support staff* ○ *Interpret psychological tests* ○ *Monitor therapeutic progress*
Optional skills and competences	○ *Write research proposal* ○ *Ensure safety of students* ○ *Secondary school procedure* ○ *Show understanding for the situation of pupils* ○ *Promote the well-being of children* ○ *Supervise extracurricular activities* ○ *Keeping up to date with expertise* ○ *Assist in the organization of school events* ○ *Conduct psychological research* ○ *Publish scientific research* ○ *Communicate about the well-being of the young person(s)*
Optional knowledge	○ *Consulting* ○ *Evaluation procedure* ○ *School Law* ○ *Communication breakdowns* ○ *Learning Needs Assessment* ○ *Performance weaknesses* ○ *Behavioral problems* ○ *Psychiatric disorders* ○ *Scientific research*

DC of the SP was explicitly not mentioned.

In the context of higher education, the EQF initiated a paradigm shift from input to output orientation within the framework of the Bologna Process (1999). The Bologna Process was a term used to describe a transnational higher education reform aimed at the Europe-wide standardization of study courses and degrees as well as the international mobility of students, with the goal of creating a single European Higher Education Area. As a result of the Bologna Process, European higher education institutions were undergoing a convergent reform process to be able to establish comparability of curricula in terms of structures, programs, and teaching. In the past, the description of study programs was primarily characterized by subject-specific study content, admission criteria and study duration (input). The shift to an output approach with an orientation towards learning outcomes required the development of a catalog of subject-specific and cross-disciplinary competences for learners, as well as adjustments in teaching, learning, and assessment methods. In this reform process, the required academic and professional profiles played an important role.

In 2005, the EQF was operationalized in the Qualifications Framework for the European Higher Education Area (QF-EHEA) (BOLOGNA WORKING GROUP 2005). The QF-EHEA comprised three cycles (bachelor, master, doctorate) with subject-specific and interdisciplinary descriptions for each cycle based on learning outcomes and competences. Learning outcomes were described by "knowing, understanding, applying, analyzing, synthesizing and evaluating"(BOLOGNA WORKING GROUP 2005, p.38). Thus they benefitted from the KRATHWOHL taxonomy. Learning outcomes were used to describe verifiable capabilities indicating that distinguishable competences could be expected to be acquired (BOLOGNA WORKING GROUP 2005, p.41).

‚Tuning Educational Structures in Europe' was a project by and for higher education institutions to implement the Bologna Process in specific subject disciplines. It focused on the implementation of this reform process by developing reference points for common curricula of higher education institutions according to the EQF based on agreed subject-unspecific and subject-specific descriptors for the degree levels Bachelor, Master, and Doctorate. In addition to subject-specific competences in each learning area, the Tuning Project identified 31 transversal competences in the three categories of instrumental, interpersonal, and systemic competences. The reference points developed for the discipline of Psychology "Tuning-EuroPsy: Reference Points for the design and delivery of degree programs in Psychology"(GONZALES FERRERAS & WAGENAAR et al. 2011, p.20/21) will be presented in the following chapter.

5.2.4. TUNING-EUROPSY

Parallel to the development of the EuroPsy certificate under the responsibility of the European Federation of Psychologist Associations

(EFPA) as a required European standard for professional practice of a psychologist, the project "Tuning-EuroPsy" (GONZALES FERRERAS, WAGENAAR et al. 2011) succeeded in presenting a European reference framework for education and training in the field of psychology based on the EQF. The task of (school) psychologists was defined as follows:

"*Professional psychologists apply psychology and psychological knowledge and understanding to real-life questions in order to enhance the well-being and effectiveness of individuals, groups, and systems... Educational psychologists, sometimes called school psychologists, also engage in assessments and interventions, normally in educational settings. They may also work in consultancy and other forms of more indirect work .... Psychologists also work closely with professionals in other fields, often in multi-disciplinary teams with psychiatrists and social workers, educational psychologists work with teachers and other educational professionals, and also with health professionals…*." (GONZALES FERRERAS, WAGENAAR U.A. 2011, p.20/21)

The training and professional practice of (School) Psychologists according to the scientist-practitioner model required

- a development of skills in research and practice;
- an evidence-based approach that relied on a scientific knowledge base and validation of methods, theories, and treatments;
- a practice that provided insights for research to further develop professional practice.

Accordingly, the key role of professional psychologists was *"… to develop and apply psychological principles, knowledge, models, and methods in an ethical and scientific way in order to promote the development, well-being, and effectiveness of individuals, groups, organizations, and society."* (GONZALES FERRERAS & WAGENAAR et al. 2011. p.22)

Competence was understood in the Tuning Project as follows: "*Competences represent a dynamic combination of knowledge, understanding, skills, and abilities that the student builds and develops during a period of study. Fostering competences is a major goal of educational programs. The Tuning Project identifies two types of competences: generic competences which are those which would be expected of any graduate in any subject (e.g., capacity to learn, capacity for analysis, **digital competence**, meta-cognitive competence) and which are transferable and related to flexible employability, and subject specific competences which are related to the specific field of study and often referred to as academic-subject specific competences*." (GONZALES FERRERAS, WAGENAAR U.A. 2011. p.45)

Thus, the promotion of DC should be anchored in the bachelor's program of psychology studies.

The Tuning-EuroPsy understanding of competence as a subject-related disposition to be acquired was compatible with the assumptions of DiCoSP to define competence.

The Tuning - EuroPsy project was based on a competence model developed by the organizational psychologist ROE (1999). He defined competence as *"a learned ability to adequately* perform *a task, duty, or role.*" (ROE 2002, p.195)

ROE illustrated "competence" as an architectural model (Figure 15). Accordingly, competence is built on the integration of KAS and acquired by work experience and learning by doing.

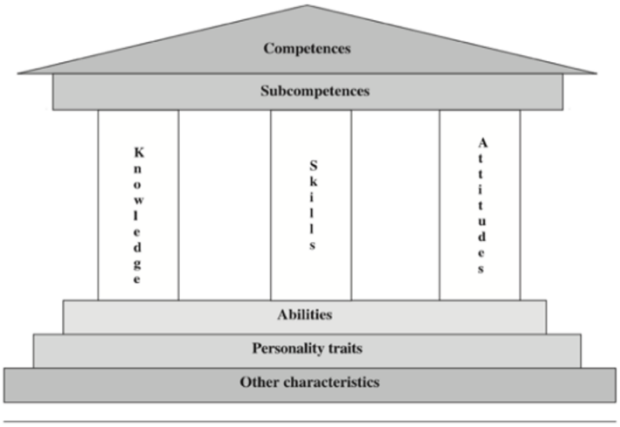


FIGURE 15 *Competence model for psychology from ROE (1999) Source BARTRAM a.o. 2005, p.95*

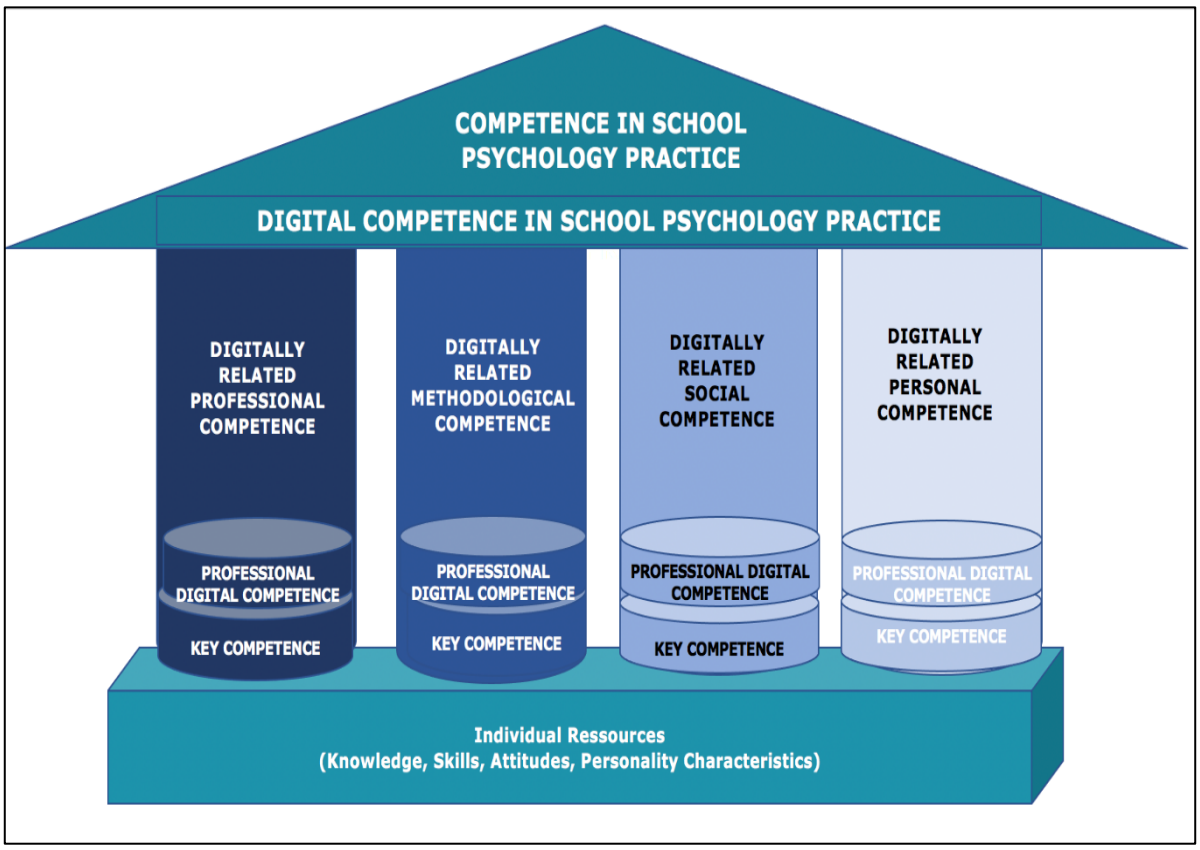
"*This whole structure is built on the individual person's dispositions, i. e. abilities, personality traits, interests, and values etc. They define capabilities to learn, acquire the necessary knowledge and skills, display the appropriate attitudes, and ultimately, to carry out psychological services for their clients to the standard expected of them by their profession.*" (GONZALES FERRERAS, WAGENAAR U.A. 2011. p.51)

ROE defined a competence profile as *"a list of competences, subcompetences, knowledge, skills, attitudes, abilities, personality traits, and other characteristics that are essential for carrying out a job or an occupation."* (ROE 2002, p.197) He thus classified DC as a subcompetence of school psychological competence and assumed that a DC competence framework was composed by a list of KAS as foundation of competence.

The ROE model was chosen as the template for the DiCoSP competence framework because it

- was compatible with the action-theoretical understanding of competence as disposition
- was compatible with the EQF by bundling KAS as the basis of competence
- enabled the acquisition of competences through active self-directed learning and constructivist didactics.

FIGURE 16 DICOSP DIGITAL COMPETENCE MODEL IN SCHOOL PSYCHOLOGY PRACTICE BASED ON ROE'S MODEL (2002)



In the DiCoSP - study, the structure of KAS as foundations of school psychological competence and the classification of DC as a sub-competence of school psychological competences were adopted. The model was further differentiated by classifying competence into the four classical competence classes (PMSP). The DiCoSP - Matrix combined this model with the school psychology fields of action according to the model of HENSGE, LORIG and SCHREIBER (2009) to a digital competence framework in school psychology practice (Figure 14).

The term **professional competence** was defined in Tuning-EuroPsy as "*the state of having the knowledge, judgment, skills, energy, experience, and motivation required to respond adequately to the demands of one's professional responsibilities.*" (GONZALES FERRERAS, WAGENAAR et al. 2011. p.46)

This understanding was compatible with the DiCoSP definition.

According to the Tuning Project the underlying KAS of professional competence included:

- **Knowledge** to explain and interpret concepts, theories, empirical evidence about change processes, the design of change interventions

at the individual, group, institutional or organizational, and societal levels,
- **Skills** to explain and evaluate psychological constructs and to use or develop explanatory and change knowledge;
- **Attitudes** for responsible professional practice;
- **Basic competences,** such as problem solving, teamwork, critical thinking, and other transversal competences that can be learned, especially using problem-based learning, experiential learning, simulations, role-playing. (GONZALES FERRERAS, WAGENAAR et al. 2011. p.52/3)

A detailed list of the four types of competences, which needed to be acquired during psychology training and supervised practice, can be found in APPENDIX 18.

The competences listed in the "Tuning Psych - Model" have been considered in the DiCoSP framework. In the DiCoSP model, the "basic competences" of Tuning-EuroPsy were classified as key competences and formed an integral part of the four competence classes.

Tuning-EuroPsy proposed methods of problem-based active, real-life learning for teaching and learning. Learners were expected to reflect on their own learning to develop metacognitive skills. The goal was to develop competence and confidence by practicing activities in a job-related environment. It was expected to acquire competence by a combination of knowledge development, understanding, and practice in the field (microanalysis of video recording, viva voce examination, role-playing, internship, whereby learning is modeled by an experienced psychologist and via formative feedback). This approach was compatible with ARNOLD's (2017) concept of enabling didactics.

5.3. EUROPSY - MODELL

The EuroPsy model (EFPA 2021) was a basic standard for professional competences as well as for the professional ethical behavior of European psychologists in practice, under the responsibility of the European Federation of Psychologists' Associations (EFPA). It was a professional action-based competence model that defined competence and professional competence as follows:

„Competences are based on knowledge, understanding and skills applied and practiced ethically. The competent practitioner is not only able to demonstrate the necessary skills but also attitudes appropriate to the proper practice of their profession. Attitudes are of special importance since they define the unique nature of the psychological profession. While some knowledge and skill is general in its applicability, much of it is context -

related." (EFPA 2021, p. 45) *"Professional competence refers to the ability to adequately fulfil a professional role."* (EFPA 2021, p.33)

Whereas the definition of professional competence differed from the DiCoSP understanding of competence as a disposition, the EuroPsy model also assumed that competence is based on knowledge, skills, and attitudes.

EuroPsy was launched in 2010 and was available in 25 European countries, including AT and DE. In BE and CH this is a future project. The license to practice was subject to sovereignty of states, so that EuroPsy was not a license to practice in a country. The EuroPsy certificate had nevertheless an important significance. It

- certified individually that psychologists have a high standard of training. This allowed them to demonstrate qualified training to employers and clients internationally, which facilitated their professional mobility in Europe and increased confidence in their professional qualifications.
- Promoted the recognition of a Europe-wide standard in training and professional qualification of psychologists.

The EuroPsy standard required five years of university education in psychology with an approved curriculum plus one year of supervised practice. EuroPsy included a commitment to comply with the EFPA Code of Ethics (EFPA 2005) and to undertake continued professional development (CPD). The EuroPsy certificate was valid for seven years and was renewable. Psychologists who met the EuroPsy requirements could apply to their country's National Recognition Commission for the EuroPsy certificate and be entered into the EuroPsy register, which was maintained online and could be consulted worldwide. Uptodate, there was no specification of the EuroPsy certificate for school psychology.

In the DiCoSP competence framework, the content of the EFPA Ethics Code was considered, in addition to the competences already described in the Tuning Project.

5.4. COMPETENCE PROFILES OF SCHOOL PSYCHOLOGISTS IN AT, BE, CH, DE

In **AT**, the job of a SP requires a master level degree in psychology and four years of on-the-job 'basic training' being completed by a state examination (BUNDESMINISTERIUM FÜR BILDUNG, WISSENSCHAFT UND KULTUR 2000). The in-service training included the following qualification objectives sorted by DiCoSP competence classes:

QUALIFICATION GOALS INTERN SERVICE TRAINING OF AUSTRIAN SPs			
Professional competence	**Methods competence**	**Social competence**	**Self competence**
Knowledge of psychological counseling, examination, and expert report work.	Skills of school related psychological research	Necessary knowledge to disseminate for public information	
Knowledge of psychological care and treatment of individuals or groups.		Knowledge for teaching in seminars	
Knowledge of psychological research related to schools		Knowledge in promoting cooperation among schools and other institutions being relevant for schools	
Detailed knowledge of the Austrian education system and of information relevant for educational (school career) guidance and counseling		Skills in fostering cooperation among schools and other institutions being relevant for schools	
Knowledge of implementation of tasks around "school psychology – educational (school career) counseling"			
Knowledge of the basics of professional practice according to the mission statement (self-image) of school psychology - educational (school career) counseling, the service law as well as other relevant legal regulations, such as school laws, the Narcotic Substances Act, the Psychologists Act, and the Psychotherapy Act.			
Application of knowledge in psychological counseling, assessment, and expert activities, especially in questions of school career choice, school readiness, special educational needs, learning and behavioral problems, personal difficulties, and crises, individual (educational) needs and special abilities and talents.			
Skills in psychological care and treatment of individuals or groups.			

This regulation did not mention explicitly any DC.

In **BE,** the title of 'Psychologist' is regulated since 1993 and 'Clinical Psychologist' since 2019. Employment as a Psychologist in the educational sector (predominantly: Center for the Healthy Development of Children and Adolescents - Kaleido in the German-speaking Community, CLB's in the Flemish Community and PMS in the French-speaking Community or in schools directly) required the academic Bachelor's or Master's degree in Psychology. At the bachelor's level, qualified individuals were hired as 'psychology assistants'. There was no longer a specific degree in 'School Psychology' in BE available since in 2019 the Flemish Catholic University of Leuven (KUL), due to legal changes for health professions in BE integrated school psychology programs into the department of 'Clinical Psychology Direction Children and Adolescents'.

In **CH,** the professions of Psychology and Psychotherapy were regulated. The federal law stipulated that the use of the title Psychologist required a degree of a Master of Science from a university with psychology as the main subject. To work as an SP in CH, the recognition as a 'psychologist' was required in accordance with the Psychologist's Act.

In addition to the provisions of federal law, certain cantons regulated the practice of the profession of psychologist, whereby a prior post-testing of professional qualifications was mandatory for the practice of the profession. Activities of SP were not regulated and may be practiced without a subsequent examination of professional qualifications. Most SPs have in-service postgraduate training in school psychology leading to the degree of a Master of Advanced Studies (MAS). This degree allowed to obtain the title "Specialist Psychologist for Child and Adolescent Psychology". It opened better employment opportunities and was required for management positions in school psychology. This advanced training was offered at the University of Zurich and Basel including learning objectives which did not mention DC.

<table>
<tr><th colspan="5">LEARNING OBJECTIVES MAS SCHOOL PSYCHOLOGY UNIVERSITY OF BASEL</th></tr>
<tr><th>Generic competences</th><th>Expertise(P)</th><th>Methodological competence (M)</th><th>Social competence(S)</th><th>Self-competence (P)</th></tr>
<tr><td rowspan="4">Transfer of the acquired knowledge and skills to everyday working life</td><td colspan="2">Diagnostic core competences</td><td></td><td>Reflection of one's own work regarding empirically based, evaluated work</td></tr>
<tr><td rowspan="3">Empirically based knowledge of counseling approaches in psychosocial work with children, adolescents, and parents.</td><td colspan="2" rowspan="2">Knowledge in conversation management, group dynamics, moderation, and mediation</td><td>Reflection on one's own professional role in the system of psychosocial care for children and adolescents.</td></tr>
<tr><td>Reflection of the knowledge of developmental psychology regarding practical work with children, adolescents, and parents</td></tr>
<tr><td></td><td colspan="2">Competence regarding legal and ethical aspects in practical work with children, adolescents, and adults</td></tr>
</table>

The learning objectives of the "MAS School Psychology University of Zurich" also did not explicitly mention DC (APPENDIX 7). The study program was based on BOLOGNA principles and the ROTH (1971) approach with competence as an expression of personal maturity: "*Continuing education is based on a humanistic-learning-theoretical conception of man, according to which each individual or system is to be strengthened and promoted in his or her personal and social resources, with the goal of enabling the greatest possible self-initiative and self-responsibility through the development of competences*." (UNIVERSITÄT ZÜRICH, free translation)

An example illustrated this understanding of competence:

Generic competences	Professional competence	Methodological competence	Social competence	Self-competence
Qualification for independent work as child and adolescent psychologists in the field of school psychology	Acquisition of general scientifically based psychological principles and specific topics in child and adolescent psychology and developmental psychology with relevance to SP.	Obtaining diagnostic information on the child, family, and school in the context of SEN support and multimodal and multiaxial assessments and classification according to IDC-10/MAS	Consulting in the intercultural and migration context	Reflection and critical evaluation of one's own school psychological work.

In **DE,** the profession of SP required an academic master's degree in psychology. In the state of Bavaria there was a special regulation. SPs in Bavaria had the status of a teacher and studied "school psychology" as an extension within their teacher training. There were three training programs available at the Catholic University of Eichstätt/Ingolstadt , the University of Bamberg , the LMU Munich . The study duration was 9 or 10 semesters depending on the teacher's degree.

The University of Tübingen was the only one in AT, BE, CH, DE offering an academic "Master's Degree in School Psychology" at university level. The German Academy of Psychology offered a curriculum "School Psychology" as a postgraduate training.

Study and examination regulations as well as the module manual for a Master's degree (M.Sc.) in the School Psychology program at the University of Tübingen served as an example of the status of the development of a competence profile of SP based on the EQF or the Tuning EuroPsy project and the German Qualification Framework (DQR) in higher education (EBERHARD-KARLS-UNIVERSITÄT TÜBINGEN 2020 a, b):

GENERIC COMPETENCES M. SC. SCHOOL PSYCHOLOGY UNIVERSITY OF TÜBINGEN		
SP have a broad, detailed, and critical understanding based on updated knowledge in one or more specialty areas	SP can consider societal, scientific, and ethical insights based on the application of their knowledge and taken decisions	SP can acquire new knowledge and skills independently and to carry out largely self-directed and/or autonomous independent research or application-oriented projects
SP can apply their knowledge, understanding, and problem-solving skills to new and unfamiliar situations that have a broader or multidisciplinary relation to their study	SP can communicate the current state of research and application to professional representatives and lay persons in a clear and unambiguous manner as well as their conclusions and the information and motivations underlying them. They can exchange information, ideas, problems, and solutions with professional representatives and with laypersons on a scientific level and to assume prominent responsibility in a team (communicative competence)	Ability to adapt and act in new situations
SP can integrate knowledge and deal with complexity		
SP can make scientifically		

sound decisions even based on incomplete or limited information		

The model of the DQR followed the taxonomy of KRATHWOHL as well as the classification in PMS (KULTUSMINISTERKONFERENZ 2017), so that the qualification goals of the Master degree in School Psychology of the University of Tübingen (EBERHARD-KARLS-UNIVERSITÄT TÜBINGEN 2020b) could be assigned to the competence classes in the context of this study (APPENDIX 8). One example:

Professional competence (P)	Methodological competence Skills (M)	Social competence Knowledge (S)	Personal-competence Skills (PERC)
SP know of the ethical principles in dealing with those seeking advice and those commissioning advice as well as of scientific ethics	SP apply supervision techniques **independently**	SP know the challenges of communicating with the public in a school psychology context.	SP **critically reflect on** professional ethical principles of the profession of school psychology.

While DC was not explicitly mentioned in the Master's program, according to Tuning-EuroPsy-EQR, digital skills were part of the Bachelor's program. The Bachelor's degree program at the University of Tübingen expected students to (EBERHARD-KARLS-UNIVERSITÄT TÜBINGEN 2020 a, b):

- plan and carry out theory-based scientific investigations and be able to use statistical procedures for their own empirical investigations in an **IT-supported** and methodologically appropriate manner;
- be able to adequately apply basic **computer-based methods** for collecting, recording, and analyzing psychological data;
- be able to reproduce, understand and apply the essential theories**,** methodological approaches, and models of the **psychology of knowledge, communication, and media** and to communicate these in a comprehensible way in different contexts (e.g. school, company) and to apply them to problems in these fields of activity as well as to know central empirical findings and to be able to critically question and reflect on them;
- to have in-depth knowledge in a subject area of knowledge, communication, and media psychology, to be able to deal with questions in the field of **knowledge, communication, and media psychology** in a scientifically sound and competent manner, to be able to critically reflect on relevant literature;
- be familiar with principles of "**open science**" that support theory-driven, confirmatory psychological research.

It can be concluded that despite the importance of the output/competence orientation in European education and training and despite the importance of DT in education and on the labor market, the training regulations for SPs in the countries studied did not provide a specific curriculum for a digital - related practice of SPs. DC is only addressed partially in curricula for SPs. So far, there is no coherent concept of a DC development of SP in the

context of education, continued professional education and training and in the context of professional activity.

5.5. KEY COMPETENCES IN PROFESSIONAL PSYCHOLOGY

An internationally unified framework of core psychological competences was declared by the International Association of Applied Psychology (IAAP 2016) and the International Union of Psychological Science (IUPsyS), which includes the following key competences of professional psychology (VON TREUE, REYNOLD 2017):

PSYCHOLOGICAL KNOWLEDGE AND SKILLS UNDERLYING THE CORE COMPETENCES
KN Has the necessary knowledge
SK Has the necessary skills
COMPETENCES IN PROFESSIONAL BEHAVIOR
PE Practices ethically
AP Acts professionally
HE Has an appropriate relationship with clients and others
WD Works with diversity and shows cultural competence
EP Works evidence-based as a practitioner
SR Reflects on own work
COMPETENCES IN PROFESSIONAL ACTIVITIES
SG Sets relevant goals
PA Performs psychological diagnosis and evaluation.
PI Performs Psychological Interventions
CO Communicates effectively and appropriately

This model consisted of a consensual collection of competences that psychologists should possess in practice which were integrated in the DiCoSP competence framework.

5.6. ISPA SEVEN ROLES MODEL

The ISPA (2016) School Psych Skills Model distinguished seven professional roles according to the CanMED framework of the Royal College of Physicians and Surgeons of Canada (FRANK & SNELL & SHERBINO 2015). This model includes professional roles as Expert, Communicator, Collaborator, Organizer, Mental Health Stakeholder, Scientific Practitioner and Professional, which were considered in the DiCoSP competence framework and questionnaire for SP. A detailed description and operationalization of the roles can be found in APPENDIX 9.

As the application of the Seven Role Model to the practice of Belgian SP in the SPILT et a. study (2021) has shown, the assignment of DC to professional role profiles can be useful to check whether and how the digital framework covered the seven roles. This model was therefore considered in the development and evaluation of the DICOSP online questionnaire.

5.7. ISPA STANDARDS FOR ACCREDITATION OF PROFESSIONAL PREPARATION PROGRAMS IN SCHOOL PSYCHOLOGY

The ISPA standards for accreditation of professional preparation programs in school psychology were also incorporated into the DiCoSP competence framework with six competence areas adapted to remote work:

1. basic knowledge in psychology and pedagogy,
2. preparation of professional practice,
3. professional decision-making, reflection, and research skills,
4. relationship skills,
5. research methods and statistical skills,
6. knowledge of ethics and the establishment of professional values.

In the ISPA standards provided some standards for the use of technology in school psychology. Given the DICOSP approach with a systemic view of DC as part of the development of a professional culture, additional ISPA standards in this study were related to DT so that the above requirements could be addressed in a digital competence framework. The adaptations to a digital context are listed in APPENDIX 10.

5.8. THE CODE® - COMPETENCE ATLAS

The scientifically founded CODE® - COMPETENCE ATLAS (HEYSE 2017) represented a general, occupation-unspecific competence structure model and could be developed in the direction of a domain-specific competence model (HEYSE, ERPENBECK 2004, p. XI-XXX), if work processes were analyzed and competence requirements were described in detail. With its collection of 64 elements of skills, competences, and qualifications, it provided a rich overview of 'key competences' relevant to the labor market (ERPENBECK 2012c, p.20). This model was criticized because of the lack of a systemic relation between the single action skills, so that there was need for further research. (BÄCKER ZAWACKI – RICHTER 2012). A detailed description of the action skills was published by the University of Applied Sciences Vienna. The CODE ® - COMPETENCE ATLAS was of interest for the DiCoSP - study as

- the cross-occupational skills in the Competence Atlas have found a broad consensus internationally as relevant future requirements on the labor market. The CODE® - Competence Atlas was based, among other things, on the 4-C model (Communication, Collaboration, Creativity, Critical Thinking) of P21 (Partnership for 21st Century Skills).

- the model was compatible with the EQF. The project "MATCH2NQF" (2015) was able to relate the CODE® - COMPETENCE ATLAS to the competence levels of the EQF and the NQF in EU - Member States, so that the skills of the competence atlas could be directly assigned to specific levels of the qualification frameworks.
- it was a general "one-size-fits-all" competence model and could be developed toward a domain-specific competence model (HEYSE, ERPENBCK 2004)

- it has been successfully applied in a research project with the Competence Lab for the development of a model "Media Competence" and in the 'Berlin Model of Digital Competence Promotion as an Additional Qualification' (SCHRÖDER 2018). In addition, the Berlin model used the learning concept of SAUTER & ERPENBECK (2013, 2015). Thus, the model had proven its suitability regarding the acquisition DC.

The DiCoSP - study assumed that the CODE® - COMPETENCE ATLAS was suitable for the development of a DC model in school psychology practice due to its character as an occupation-unspecific model, its orientation towards the classical PMSP model and its objective as a tool for competence development.

DC is a key competence in the CODE® competence atlas: *"Interdisciplinary knowledge: Dealing with information and communication technology"* within the category 'methodological competence'. For the DiCoSP study, the classification as professional-methodological competence was too restricted. DC encompasses more than only technical-methodological aspects. Thus, the model has been adapted to the profession-specific requirements of SP in education, training, and work, so that a total of 60 elements were selected as relevant for the digital competence framework for SPs and were integrated into the PMSP (APPENDIX 5). Figure 17 shows the adapted CODE® - COMPETENCE ATLAS, with colored boxes referring to statistically evaluated ITEMs in the DiCoSP online questionnaire.

CODE COMPETENCE ATLAS ADAPTED TO PROFESSIONAL PSYCHOLOGICAL PRACTICE					
SOCIAL COMPETENCE S					
Conflict Resolution capability	Cooperation ability	Ability to relate/ relation management	Social commitment	Intercultural competence	conscientiousness
Social problem solving capability	Communication skills	Consultancy	Willingness to understand	Fluency	Sense of duty
Integration skills	Ability to work in a team	Client orientation	Adaptability	Joy of Experimentation	Acquisition strength
PROFESSIONAL AND METHODOLOGICAL COMPETENCE PM					
Knowledge Orientation	Analytical skills/ Critical Thinking	Organizational skills	Planning skills	Objectiveness	Consistence
Psychological knowledge, skills and, transfer skills	Systematic-methodical approach	Conceptual strength	Project Management	Interdisciplinary knowledge and skills (information and communication management/use of ICT)	Methodical-technical problem solving Capability
Result-oriented action	Assessment Skills/Analytical skills	Goal-centered leadership	Teaching Skills	Perseverance	
Professional recognition	Consequence/risk awareness	Goal-centered action/ Determination	Market knowledge	Diligence	
PERSONAL COMPETENCE P					
Normative-ethical attitude	Helpfulness	Openness to change	Operational readiness	Resilience	
Personal accountability	Willingness to learn/ technical affinity	Reflection of own work/competence	Willingness to perform/ Drive	Discipline	
Self-Management Self - organization/ Time management	Creativity	Joy of innovation	Design thinking	Loyalty	
Decision Making skills	Holistic thinking	Initiative/ Entrepreneurship	Reliability	Credibility	

FIGURE 17 *THE CODE COMPETENCE MODEL ADAPTED TO SCHOOL PSYCHOLOGICAL PROFILES*

DC is a key competence in the CODE® competence atlas: *"Interdisciplinary knowledge: Dealing with information and communication technology"* within the category 'methodological competence'. For the DiCoSP study, the classification as professional-methodological competence was too restricted. DC encompasses more than only technical-methodological aspects. Thus, the model has been adapted to the profession-specific requirements of SP in education, training, and work, so that a total of 60 elements were selected as relevant for the digital competence framework for SPs and were integrated into the PMSP (APPENDIX 5). Figure 18 shows the adapted CODE® - Competence Atlas, with colored boxes referring to statistically evaluated ITEMs in the DiCoSP online questionnaire.

5.9. COMPETENCE - BRIDGE MODELS

The models of OBERLÄNDER et al. (2019) and VAN LAAR et al. (2017) represented bridging models in that they established a link between DC and key competences.

OBERLÄNDER & BEINICKE & BIPP (2019) conducted an extensive literature review and an empirical study on DC at work and concluded that KAS was a

useful typology for a DC model, but that there was still a need for research on *DC* in the work context:

"*A thorough analysis of the available literature revealed a lack of scientific research on DC of adults and a neglect of the work context. However, the large variety of terms and proposed frameworks shows the interest in DC in many different contexts such as education, politics, or media and communication... Furthermore, our results suggest that the concept of DC is multi-faceted and can be based on knowledge, skills, abilities, and other characteristics*." (OBERLÄNDER & BEINICKE & BIPP 2019, p. 20).

By DC, the authors meant *"Digital competences at work are a set of basic knowledge, skills, abilities, and other attributes that enable people at work to efficiently and successfully perform their job responsibilities related to digital media at work."* (OBERLÄNDER & BEINICKE & BIPP 2019, p. 11). Based on their study, 25 dimensions of DC in the workplace could be extracted:

1 Handling of hardware and software
2 Programming
3 Innovative skills and creativity
4 Information processing
5 Data organization
6 Effective usage
7 Communication
8 Collaboration
9 Networking
10 Netiquette
11 Sharing Data with others
12 Cultural aspects
13 Security and law
14 Responsibility
15 Goals and motivation
16 Willingness to learn and openness
17 Ethics and moral
18 Autonomy and independence
19 Problem-solving
20 Train/educate others
21 Application
22 Recognizing one's own knowledge gaps
23 Information Search
24 Data Information Analysis
25 Evaluating Information

Most of the dimensions were transversal key competences that have already been listed in the CODE® - Competence Atlas. Since these were important dimensions in today's workplaces, the 25 dimensions were included in the DiCoSP competence model.

VAN LAAR et al. (2017) identified the relationship between key competences for the 21st century and DC based on a systematic literature review. They found seven relevant key competences: technical management, information management, communication, collaboration, creativity, critical thinking, and problem solving. Complementary contextual skills were identified: ethical and cultural awareness, flexibility, self-organization, and lifelong learning. These findings formed the basis for a conceptual framework DC for the 21st century. This framework allowed to concretize the modes *("confident, critical and responsible")* of the EQF DC definition and to specify the vague relationship of DC and other transversal key competences (APPENDIX 11). "Creativity" was mentioned as an example of this assignment to DC:

Dimensions of digital competence	Conceptual definition with operational components
Creativity	- The ability to use ICT to generate new or previously unknown ideas, or to treat familiar ideas in new ways, and to transform such ideas into a product, service, or process that is recognized as novel in a particular field. - Content creation: Using ICT to generate ideas or develop new ways of doing things.

VAN LAAR et al. (2017) were able to show that key competences have a large intersection with professional digital competences. This insight justified to integrate the CODE® Competence Alas in the digital competence framework for school psychology practice.

6. PROFESSIONAL WORK FIELD OF SCHOOL PSYCHOLOGY IN AT, BE, CH, DE

This study attempted to compensate the lack of a common competence profile for school psychology by using and merging study results, official documents, decrees and legal regulations of requirements of school psychology practice in AT,BE, CH, DE (APPENDIX 6) as well as the international frameworks for professional competences "ISPA Standards for Accrediting Professional Preparation Programs" (ISPA 2018) and 'International Declaration on Core Competences in Professional Psychology' (IAAP 2016). The expectations of SP's competence were reviewed, compared, and summarized in a table sorted by PMSP and school psychological work fields (APPENDIX 4).

6.1. AUSTRIA

In **AT**, the Federal Ministry of Education, Science and Research defined the framework guidelines for school psychology services, which were then developed by the education directorates of the individual Länder. If an Austrian psychologist had completed training as a clinical or health psychologist, the competence profile of the profession of clinical or health psychologists regulated in Europe applied. They could work as professionals in counseling centers for children between 0-6 years, i.e. before they start school in nurseries, or in the Austrian Centers for Health Promotion in schools. These activities – part of school psychology practice in other countries - belonged to the health sector in Austria and did not fall under the jurisdiction of the Ministry of Education, Science and Research. In this respect, there were different regulations in AT depending on the sector.

The profile of all Austrian SPs included the following tasks (BUNDESMINISTERIUM FÜR BILDUNG, WISSENSCHAFT UND FORSCHUNG (BMBWF) 2018A):

*Psychological counseling and treatment in relation to issues and problems affecting individual students. This related to learning or behavioral problems, emotional stress and personal crises, or questions about further education;
*Psychological appraisal and expert work for the school authorities on issues relating to the best possible support for pupils, e. g. on questions of school readiness or any required special educational needs;
*Support in psychological issues that affected a whole school ("system-oriented psychological support"), e. g. prevention, conflict management, improvement of school climate, diagnosis, and participation in action planning in case of systematically poor learning outcomes or increasing phenomena of violence;
*Supporting schools in crisis management through preparatory measures such as the preparation of crisis plans, psychological support in acute situations and aftercare, and support for school supervision in crisis management;
*Contributions to increasing the competence of teachers on key topics in school psychology work (e. g., reading/spelling difficulties, dyscalculia, behavior problems, violence, school entry issues, recognizing and promoting special talents) about implications for educational practice;
*Research and development by evaluating and participating in studies relevant to educational work in schools, developing assessment aids, and preparing guides based on psychological findings and methods within the framework of current priorities of the Directorate of Education;
*Disseminate school psychology information about significant psychological findings and their practical application, as well as school counseling services, to all school partners;
*Coordination of psychosocial support in the school sector in the form of activities for quality assurance, professional support, and networking of all psychosocial support services for schools in the respective educational region.

Some tasks of school psychology were specifically defined by law, e. g. for expert and consulting activities in connection with the compulsory school attendance act, in questions of school readiness (§7 para. 4 SchPflG) and in cases of violations of compulsory school attendance (§25 para. 2 SchPflG), with the school instruction act in the early information system in cases of behavioral problems (§19 para. 4 SchUG) as well as questions about skipping school grades (§26 para. 1 SchUG) and with the Narcotic Substances Act (§13 para. 1 SMG).

Figure 18 illustrates the distribution of school psychological activities across working time. SPs in school psychological services spent almost three quarters of their working time on learning, behavioral and crisis counseling as well as educational counseling. Practice research hardly played an important role. Over the period 2002-2021, SP services changed in AT with a significant increase in digital services (telephone hotline, internet chat) since 2019 and a significant decrease in educational counseling (Figure 19).

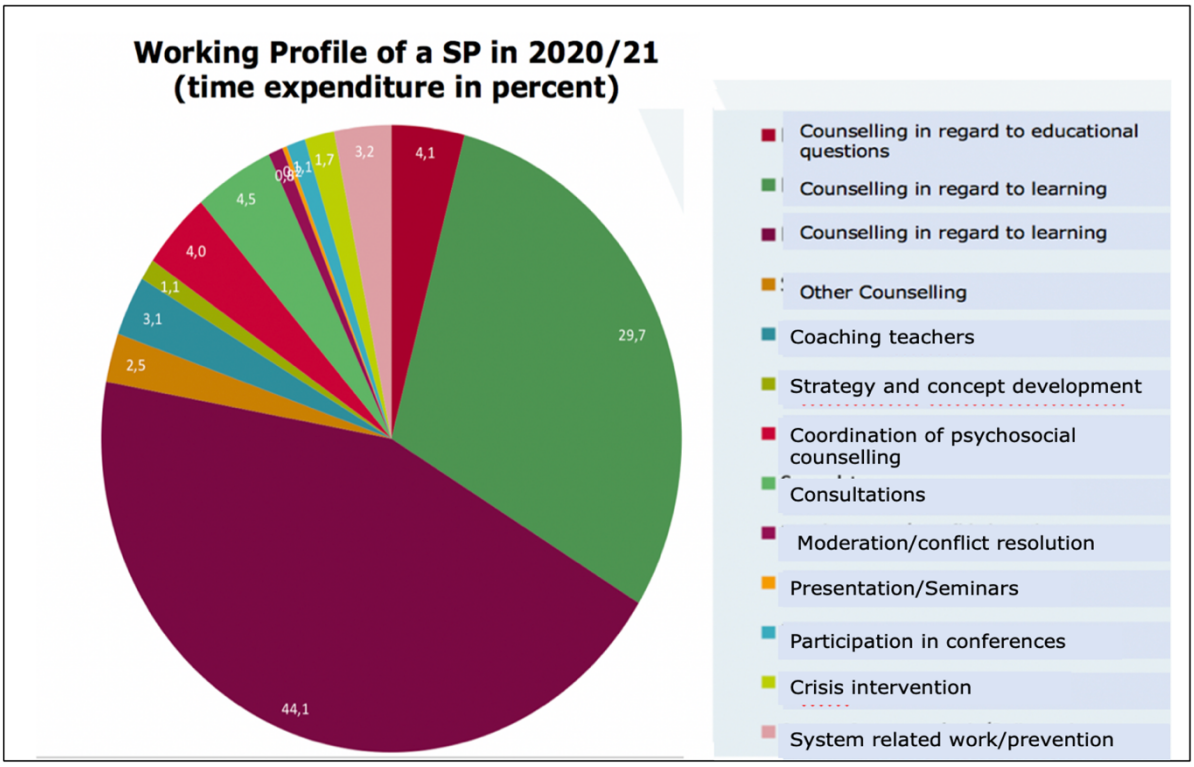


FIGURE 18 *Prototype of AT School psychology work profile 2020/2021 – statistical data BUNDESMINISTERIUM BILDUNG, WISSENSCHAFT UND FORSCHUNG (BMBWF) (2021)*

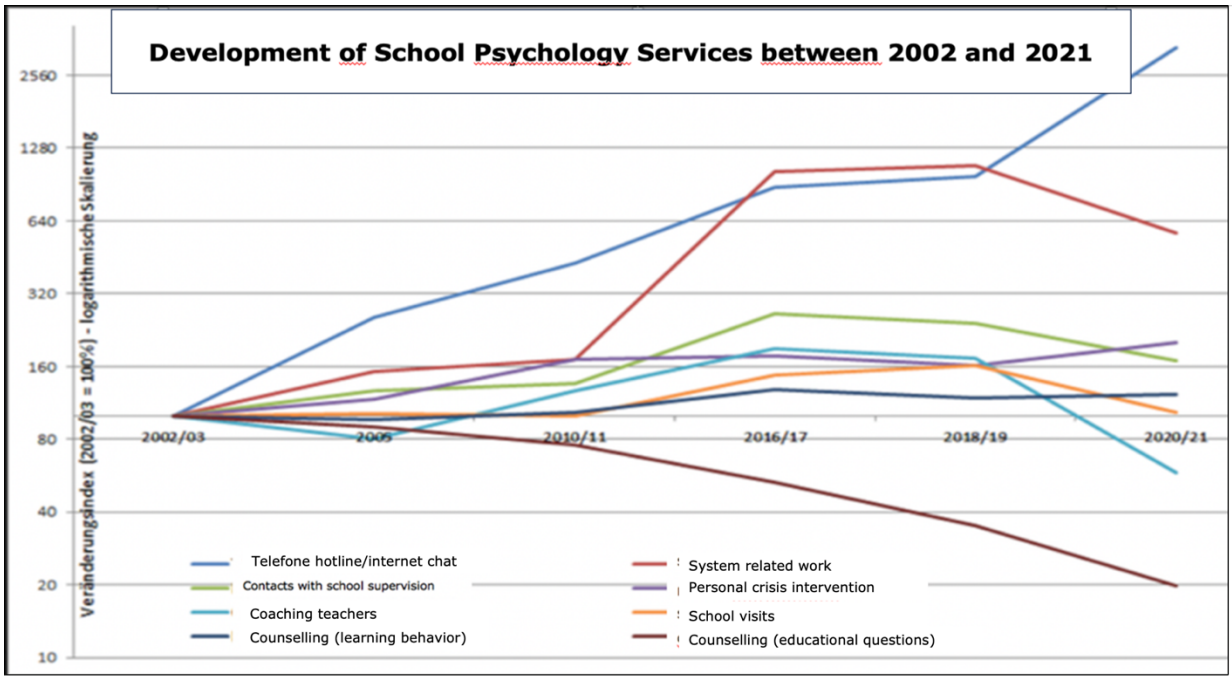


FIGURE 19 *School Psychological Services 2002 - 2021 (BUNDESMINISTERIUM BILDUNG, WISSENSCHAFT UND FORSCHUNG (BMBWF) 2021)*

One goal of the 2007 to 2009 organizational development project for school psychology/educational counseling by the Federal Ministry of Education and

Research was *"...to focus the services of school psychology-educational counseling even more strongly on the school system and on work with teachers, to be more directly present in schools, and not only to offer individual case assistance, but to focus on systems work."* (BUNDESMINISTERIUM FÜR UNTERRICHT, KUNST UND KULTUR 2013, p.72/3).

A higher proportion of system - related work remained a challenge due to limited staff resources and continued demand for traditional support services for individual SuS.

6.2. BELGIUM

In **BE,** two recent national studies were published on the professional profile of Belgian psychologists (LUYTEN & JEANNIN 2021) and SP (SPILT et al. 2021). In the German-speaking community of BE, most SP worked in the Center for the Healthy Development of Children and Adolescents – Kaleido East Belgium. The work was regulated by a ministerial decree (MINISTERIUM DER DEUTSCHSPRACHIGEN GEMEINSCHAFT BELGIENS 2014). In Flemish-speaking BE, the work of the SP as staff of the centers for pupil support (CLB) - was regulated by the decree on pupil guidance in primary, secondary and pupil guidance centers (VLAAMSE OVERHEID 2018). There was a profile of Flemish SP (VVSP 2018). In French-speaking Belgium, the work of SP as staff of the Psycho-Medico-Social Centers (PMS) was regulated by the Superior Council of PMS (MINISTÈRE DE LA COMMUNAUTÉ FRANCAISE 2007).

According to results of the national study by SPILT et al. (2021, p.35) SPs spent their working time mainly on supporting individuals and their environment, administrative work, and supporting educational institutions. Management tasks and research played almost no important role. The study arrived at the following frequency list of school psychological activities:

1. counseling/coaching
2. diagnostics
3. prevention
4. treatment/therapy

This resulted in the following order of frequencies of school psychological activities, with health promotion being performed very rarely:

1. tasks on student's psychosocial development and behavior of
2. tasks on student's learning processes and cognitive development
3. vocational orientation
4. health promotion

The results on the importance of school psychological tasks resulted in the following order:

1. Support of clients and their environment
2. Administration
3. Support for organisations
4. Psychoeducation and implementation of training
5. Collegial inter-/supervision
6. Concept work
7. Management
8. Scientific work

SP assessed their professional competence in this study based on the ISPA (2017) Seven Roles Model (SPILT et al. 2021, p.49). According to this model, SPs felt most competent in the roles of a team player and professional, and least competent in the role of scientific practitioners. The top five areas in which respondents felt most competent were

- Open and respectful communication with students, parents, and teachers,
- Client-appropriate oral and written reporting,
- Reflection on one own‘s strengths and weaknesses,
- Knowledge of the cognitive, social, and emotional development of students and
- effective collaboration with external psychologists or educators.

The areas in which respondents felt least competent were

- Communicating with foreign language clients in their language and providing culturally sensitive assessment, counseling, and treatment;
- Knowledge of biological processes that correlate with psychological functioning;
- Critical evaluation of psychometric properties of instruments;
- Knowledge of health education and evaluation of its quality, conduct scientific research, and critically evaluate scientific evidence;
- Support schools/organizations in the selection, implementation, and evaluation of innovations.

Respondents felt that the least important aspects of their work were critical evaluation of psychometric properties of instruments, assessment of the quality of scientific research results, knowledge of underlying biological processes of psychological well-being, and knowledge of health.

6.3. SWITZERLAND

In **CH** there was no national profile of SP due to the federal structure. The school psychology practice profiles were mainly determined by the cantons, districts and municipalities, while the association "School Psychology Switzerland - Intercantonal Leadership Conference"(SPILK) tried to coordinate the different regulations nationally, among others with guidelines (INTERKANTONALE LEITUNGSKONFERENZ 2014) for the design of school psychology and job profiles (INTERKANTONALE LEITUNGSKONFERENZ 2019).

There was the following common understanding:

SP have competences and knowledge in developmental and learning psychology, diagnostics, counseling, therapy, coping, coaching,

supervision, and social and organizational psychology. Their main competences are in prevention, intervention, crisis management, school development, and impact and practice research. The different fields of work are:

- Consulting, Coaching, Supervision
- Progress controls, monitoring, assessments
- Assessments
- Clarification of the need for support
- Recommendations and applications for support measures and school types
- Reporting, expert opinions
- Cooperation with specialized agencies, authorities, and institutions
- Public relations, participation in expert groups and commissions
- Psychoeducation, training for teachers, authorities, parents, children
- Crisis intervention, emergency psychology
- Work in class, work with school teams
- School and organizational development
- Prevention
- Treatment

Processing individual cases took up the largest part of school psychology resources (INTERKANTONALE LEITUNGSKONFERENZ 2014). Ethical guidelines applied to the practice of the profession. The guiding principle of professional action was personal professional responsibility, especially when dealing with sensitive personal data. School psychology was committed to the best interests of the child in accordance with the UN Convention on the Rights of the Child. Professional activities were performed based on scientifically validated and practice-proven methods of psychology and its related fields. The services were based on the professional code of conduct of the Federation of Swiss Psychologists (FSP) and the Swiss Association for Child and Adolescent Psychology (SKJP), respectively the standards of the federal specialist title for child and adolescent psychology.
The quality of the services was ensured by intervision, supervision, advanced trainings as well as practice research and client feedback.

The activity profile 2020 of the school psychological service of the canton of Pfäffikon was a representative example of the activities of SPs in CH (FIGURE 20). A large part of the work time was spent on assessments, administration and coordinating internal service activities (meetings related to assessments, internal service work).

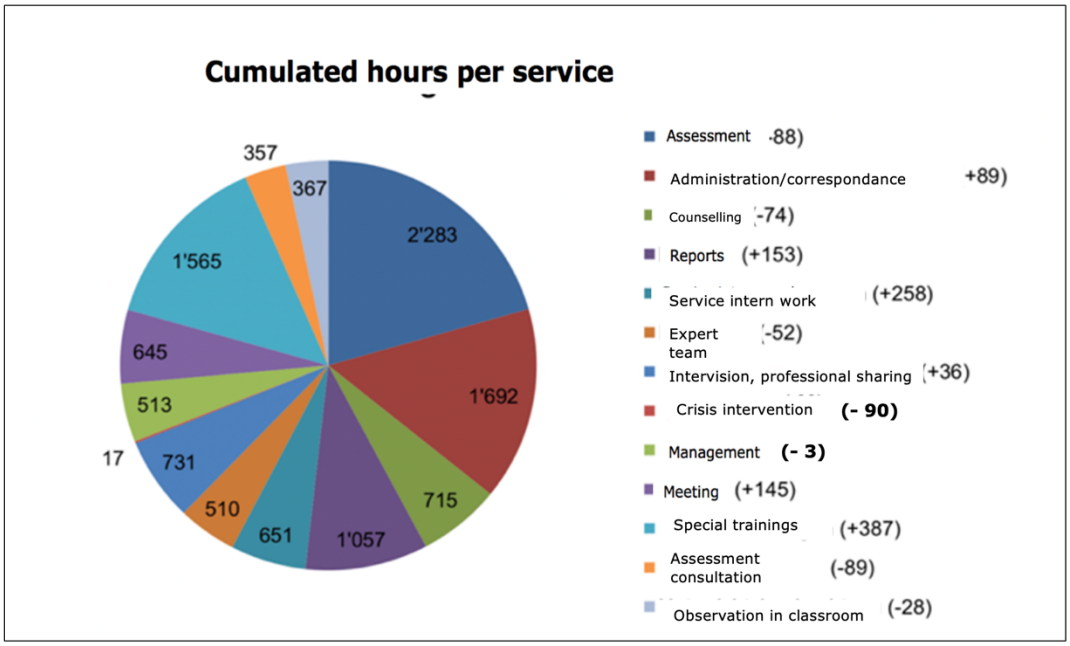


FIGURE 20 *Activity profile of the School Psychological Service of the Canton Pfaeffikon 2020* https://www.spd-pfaeffikon.ch/fileadmin/user_upload/Organisation/Jahresberichte/Jahresbericht_2020.pdf

6.4. GERMANY

In **DE,** due to the federal structure, each of the sixteen federal states had its own autonomous educational system with its own school laws defining the requirements for school psychology practice. There were no recent empirical data available of the profile of requirements for SPs in Germany, only a profile description of SPs by the BDP (2015). However, a research project on the topic "Professional profile of school psychology in Germany" (VON HAGEN et al. 2020) was in progress. According to the BDP professional profile, important competence profiles of the SP included knowledge in:

- School and education system of the respective state,
- Conditions of local schools and regional psychosocial infrastructures,
- Learning processes and behaviors of children and adolescents,
- Developmental trajectories of children and adolescents,
- Group processes and dynamics in classes and groups,
- Psychotherapeutic, systemic, and learning therapy methods,
- Methods of social and cooperative learning,
- Crisis intervention in schools,
- Instructional didactics, classroom management, and school development,
- Methods of presentation techniques as well as moderation of groups, methods of coaching, supervision, mediation, and conflict management. (BDP 2015, p.10)

According to the BDP, the tasks of the German SP include:

- Support and advice for parents, pupils, teachers, pedagogical staff, school management and school supervision, colleges and school classes, school as an

organization and as an institution in its educational mission, committees, and quality circles.

- Individual case consultation for learning, developmental and behavioral problems of pupils, e.g. questions of giftedness, support assessments and support measures, self-efficacy, social and methodological competence.

- System related counseling for schools on issues of school and quality development, development towards inclusive schools, support measures for social interaction in school classes, school crises, health in schools, conflict management, team counseling, supervision and coaching, advanced training, quality circles and committee work.

JIMERSON et al. (2006) published the results of an international survey among SPs in Australia, China, Germany, Italy, Russia on their working time. Most working time was spent on assessments and counseling. In Germany, the importance of practice research was relatively low. 21% of the respondents did not consider research to be relevant in their practice. Needed evidence based information was related to dyslexia, teacher health, attention problems, and math difficulties. German SPs spent most of their work time on psychoeducational evaluations and consultation. Table 1 shows the average share of school psychology activities in the SP's work time:

TABLE 1 *RESULTS STUDY JIMERSON et al. (2006, P.15) PROPORTION OF SP'S ACTIVITIES IN WORK TIME*

Activity	Median
Psychoeducational evaluations	28%
Parent/family counseling	15%
Student counseling	14%
Consulting for teachers/educational specialists	13%
Training of pedagogical staff	15%
Administrative activities	11%
Direct interventions	7%
Implementation of primary prevention programs	8%

6.5. CONCLUSION

The analysis of the available material led to the following simplified classification of the most important common practice fields SP in AT, BE, CH, and DE. For each activity the individual, group and system level had to be considered:

- **Prevention and intervention**

  - Advice, guidance, support, promotion
  - Psychoeducation
  - Information to the public
  - Training of pedagogical staff
  - Crisis intervention (intervention)

- Therapy/treatment (intervention)

- **Assessments and Evaluation**
  - Assessment
  - Tests
  - Writing of reports (expert opinions, assessments)
  - Evaluation (including monitoring; own service, school programs, projects...)
  - Scientific practice

- **Administration, professional development, and work orientation**

  - Administrative tasks (writing statistics, documentation, emails, calendar - and file management, etc.)
  - Own training
  - Professional collaboration/networking (work processes)
  - Work orientation (individual, company): Professional ethics, mindset, operational leadership.

These identified areas of professional activities structured the DiCoSP matrix of the digital competence framework (Figure 14). The comprehensive assignment of identified common activities of SP in AT, BE, CH, and DE to school psychology fields sorted by PMSP (APPENDIX 4) matched with identified professional DC and key competences can be found in APPENDIX 13. Two examples can illustrate the model (red cases):

PROFESSIONAL WORKFIELD		DIGITAL COMPETENCE											
		PROFESSIONAL COMPETENCE			METHODOLOGICAL COMPETENCE			SOCIAL COMPETENCE			PERSONAL COMPETENCE		
		Data and Information-, Communication-, Media-, Technological Competence Key Competences			Data and Information-, Communication-, Media-, Technological Competence Key Competences			Data and Information-, Communication-, Media-, Technological Competence Key Competences			Data and Information-, Communication-, Media-, Technological Competence Key Competences		
		Knowledge	Skills	Attitude	Knowledge	Skills	Attitude	Knowledge	Skills	Attitude	Knowledge	Skills	Attitude
PREVENTION AND INTERVENTION	COUNSELING,SUPPORT, GUIDANCE, PROMOTION												
	PSYCHOEDUCATION, TRAINING , PUBLIC INFORMATION												
	TREATMENT/ THERAPY												
	CRISIS INTERVENTION												
ASSESSMENT, EVALUATION	ASSESSMENTS												
	TESTING												
	DECISION MAKING, REPORTING												
	EVALUATION, MONITORING												
	SCIENTIFIC PRACTICE												
ADMINISTRATION, PROFESSIONAL DEVELOPMENT	ADMINISTRATION												
	LIFELONG LEARNING, CONTINUED PROF DEVELOPMENT												
	PROFESSIONAL COLLABORATION/ NETWORKING												
	WORK ORIENTATION (INDIVIDUAL ORGANIZATIONAL)												

WORK FIELD	SCHOOL PSYCHOLOGICAL DIGITAL COMPETENCE IN PRACTICE	**Example 1:** *"SP have sound knowledge (theory, conceptual and reflective knowledge, models, procedures, research, evaluation studies, evidence-based practice experiences) and critical understanding of standardized electronic testing procedures to diagnose and evaluate personal, cognitive, psychosocial skills, vocational interests."*
ASSESSMENTS AND EVALUATION - TESTING	**1. COMPETENCE CLASSES PMSP /KAS** '**knowledge** of the competence class digitally related **methodological competence'**	**SP have knowledge of testing procedures**
	2.PROFESSIONAL DIGITAL COMPETENCE (IDC, MEC, CC, TC) '**knowledge** of the class '**media competence'** within the class digitally related methodological competence'.	**SP have knowledge of electronic testing procedures**
	3. TRANSVERSAL KEY COMPETENCE	**Critical Thinking** **Having professional knowledge**

EXAMPLE 1 on deals with school psychological DC in the area diagnostics, particularly testing. As it is about the knowledge of test procedures methods of test application are involved. Thus, the example can be assigned to the category 'knowledge of the competence class methodological competence', particularly 'knowledge of the class 'media competence' of professional digital competence within the class methodological competence'. Media competence is involved as the knowledge of electronic tests as professional tool is important. The example can also be assigned to the transversal key competence 'subject knowledge' and/or 'critical thinking'.

WORK FIELD	SCHOOL PSYCHOLOGICAL DIGITAL COMPETENCE IN PRACTICE	**Example 2** ***SP are interested in taking care of their own digital well-being in the workplace***
ADMINISTRATION AND PROFESSIONAL DEVELOPMENT, WORK ORIENTATION	**1. COMPETENCE CLASSES** '**attitude** of the competence class **personal competence'**	**interest in taking care of one's own well-being**
	2.PROFESSIONAL DIGITAL COMPETENCE: '**attitude** of the class '**technological competence'** within the class digitally related personal competence'.	**interest in solving health problems related to remote work**
	3. TRANSVERSAL KEY COMPETENCE	**Self-Management**

EXAMPLE 2 deals with school psychological DC in administration, professional development, work orientation. Caring for one's own health at the workplace is a personal competence how to deal with work requirements, meaning a question of work orientation. It is also related to technological competence as remote work challenges to search for work-life-balance. Thus, SPs need to adapt their personal lifestyle to problems created by DT of the workplace. This adaptation is a question of self - management, which is seen as an important key competence in present and future workplaces.

The collection did not intend to be a complete review as there was no evidence-based professional profile and as new requirements will arise with advances in technology. It was only an excerpt from a repertoire of existing "target profiles", which can be flexibly adapted to the needs of users.

7. SUMMARY DIGITAL COMPETENCE FRAMEWORK IN SCHOOL PSYCHOLOGY PRACTICE

The goal was to develop a comprehensive overview of digital competence of SP in practice in form of a digital competence framework to provide guidance and a template for future educational offerings to acquire DC.
Starting from a confusing diversity of the terms and concepts of "competence" and "digital competence", a variety of competence models, and a lack of evidence-based school psychology professional profiles, the DiCoSP - study has tried to find convergences. Due to the practical orientation, it made sense to choose an action-theoretical basis that focused on the ability to self-organize. This was one of the most important competences to be able to act professionally at workplaces in digital transformation, determined by the VUCA characteristics of volatility, uncertainty, complexity, and ambiguity.

Based on the competence models of ROE (2002), ERPENBECK (2007) and HENSGE, LORIG & SCHREIBER (2009) as well as on the digital competence models of LARRAZ (2013) and the EUROPEAN REFERENCE FRAMEWORK FOR DIGITAL COMPETENCE (FERRARI et al. 2012), a definition of DC could be derived and a digital competence framework for school psychology practice could be developed, consisting of an architectural model and a matrix. The matrix combined the subjective side of DC in the form of four classes, namely professional, methodological, social, and self-competence with the object related side of school psychological action fields. The PMSP classification has found a broad consensus in education and the world of work and originated in ROTH's (1971) triad. The competence classes were based on individual resources in the form of the typology of knowledge, skills, and attitudes (KAS) and personal characteristics. This typology went back to a consensus position according to WINTERTON et al. (2006). The KAS are constituent elements of DC. These considerations led to the following definition of DC in school psychology practice:

Digital competence in school psychology practice is a disposition to be able to act in digitally related professional situations in a self-organized, creative, critical, responsible, and goal-oriented manner based on individual resources - a set of personality traits, digitally related knowledge, skills, and attitudes - within an organizational structure. Digital competence consists of the competence classes digital-related professional competence, methodological competence, social

competence, and personal competence.
Each digital competence class is a synthesis of school psychological competence, transversal key competence, and professional digital competence, consisting of the classes data and information competence, media competence, communication competence, and technology competence.

DC was composed of three levels in the DiCoSP concept:

- transversal key competences which are important for coping with requirements of the digitalized working world of the 21st century; they are based on ERPENBECK/HEYSE's research for the CODE® - Competence Atlas;
- transversal professional digital competences, which represent the digital toolbox. Without this toolbox the application of digital resources would not be possible. They consist of the classes data and information, media, communication, and technology competence. This classification is based on research by FERRARI (2012), LARRAZ (2013);
- profession-specific digital-related professional, methodological, social, and personal competence (ROTH 1971, REETZ 1999, ERPENBECK 2007)

This composition was represented in an architectural model of DC in school psychological practice based on the model of ROE and a matrix according to the model of HENSGE, LORIG and SCHREIBER (2009). The object-related side of the matrix naming the school psychological work fields was assigned to the subject-related side in the form of the classes digitally - related professional, methodological, social, and personal competence, each subdivided into KAS.
The presented comprehensive collection of constituent elements of "DC competence" did not claim to be exhaustive because there were no evidence-based professional profiles of SPs, nor are future requirements foreseeable due to rapid technological advances.
The MATRIX provided a comprehensive structure of school psychology competences in the context of DT. The structure allowed flexibility to be able to create needs - based DC profiles of the SP's profession as well as of individuals and organizations. The structure allowed to add or eliminate competences according to the needs. At the expense of flexibility was the lack of evidence for the assignment of fundamentals and competences. This was a disadvantage for basic research when it comes to precise assignments between competences the required prerequisites for them. More research is needed in this area.

8. METHODICAL APPROACH

8.1. INTRODUCTION

The DiCoSP - study attempted, by means of a literature review, expert interviews, an online questionnaire for universities, employers and professional organizations, and an online questionnaire for German-speaking SPs in AT, BE, CH, and DE to

o Identify DC-related needs of SPs in practice,
o Identify DC-related training needs of SPs in practice,
o Develop a DC framework for SP professional practice.

DICOSP is based on the following hypotheses:

- SPs consider DC to be important in their professional practice
  Indicator: at least 75% of respondents agree with the statement "*Digital competence is important or rather important in my daily work;*

- SP use digital resources in their work
  Indicator: at least 75% of respondents report that they use the Internet for their work at least once or several times per day;

- SPs have a need to develop their DC
  Indicator: at most 25% of the SPs surveyed say they have no need for digital skills acquisition;

- SP consider the training offer on DC to be insufficient
  Indicator: at least 75% of respondents state that they perceive the training offered on DC in their work environment to be rather inadequate or that such training is not available.

The identified need for DC formed a basis for testing the theoretically developed model of a DC framework against practice.

Guiding questions for the development of a framework concept were:

1. What are the characteristics of "DC in school psychology practice"?

2. How can 'DC in school psychology practice' be operationalized in a needs - based framework?

The DiCoSP - study followed a mixed-methods approach:

Starting point: A systematic literature review on required DC in school psychology formed a basis for the development of a survey of SPs and for the development of a framework concept.

Focus groups: Two exploratory qualitative in-depth expert interviews with SPs from AT, BE, CH, DE (N=11) provided the opportunity to verify the results of the literature review and to support the development of the questionnaire by means of feedback from school psychology practice.

Online survey: A standardized online questionnaire on DC of SP was developed and delivered to SP, comparable to the survey in the reference study "Digital skills for youth" for professionals in youth work (CONSORTIUM OF THE PROJECT DIGITAL SKILLS FOR YOU(TH) 2018). The limited project duration and financial resources suggested an online tool that allowed more SP to be contacted in less time compared to face-to-face inquiries.

Development of a digital competence framework: Based on the literature review, expert focus groups, and survey results, a digital competence framework was developed and an analysis of SP training needs was conducted (APPENDIX 14 STEPS OF DEVELOPMENT)

Preparation of a research report: A bilingual research report (D/EN) was prepared to describe the study and to summarize the main findings.

Mentoring and evaluation: As a mentor, Prof. Dr. Volpe was available to advise the DiCoSP team. His support in methodological questions as well as the questionnaire review were a valuable help. The project internal evaluation was done by the project coordinators. Thankfully, the external evaluator Prof. Dr. Stuart Hart evaluated the scientific DiCoSP project quality.

Research Interest: The purpose of the DICOSP study was to use the study results as a basis for planning future learning formats on DC acquisition in school psychology. This research project is part of an ADDIE - analysis phase. The ADDIE model (BRANCH 2009, ZAWACKI-RICHTER 2013) was a widely used model in the field of instructional design. The ADDIE acronym represented the components in creating instructional designs: analysis, design, development, implementation, and evaluation. The analysis phase was characterized as follows:

1. Analysis of the learners (prior knowledge, what skills do they already have, learning needs?)
2. Analysis of the teaching (which learning steps and methods are necessary to achieve a learning goal).
3. Analysis of the teaching objectives (What is to be achieved? What is to be learned?)
4. Analysis of learning objectives (What measurable things can learners do after achieving the learning objective (knowledge, skills, behavior,

attitude)? How is learning outcome measured (measurement indicators and instruments, assessment conditions)?

DiCoSP provided a basis for answering the following questions about SP training needs analysis as part of this analysis phase:

- What kind of DC do SPs need in their practical work?
- What are the learning and training needs of SPs (needs of information, knowledge, skills, attitudes, which hurdles do SPs face to attend training)?

Thus, this study involved a "design-based research" (DBR) approach, which aimed to develop innovative solutions to practical educational problems and to combine this process with gaining scientific knowledge. The characteristic of development-oriented educational research as that researchers themselves act as developers of an intervention, e. g. as designers of a learning module, and accompany this process in an investigative way, e. g. in DiCoSP by analyzing the initial situation in the form of the characteristics of DC in school psychology practice and the need for DC acquisition (GERNER 2019).

According to ZAWACKI/RICHTER (2013), demand could be divided into the following categories:

- **Normative need** for the SP to be compared with an (inter-) national standard. To make this possible, the SPs were offered the possibility to participate in a free, individual assessment of their digital competence according to the standards of the European digital competence framework (DigComp) (CARRETERO GOMEZ, VUORIKARI, PUNIE 2017). The aggregated common digital competence profile of participating SPs served as a comparative parameter for the results of the SPs' subjective assessment of DC in the DiCoSP - online questionnaire. The implementation and evaluation of this DC profile of SP was carried out by the company GEPEDU, having many years of experience in online-based, professional aptitude assessments and in cognitive performance measurement in German-speaking countries with a team composed of predominantly psychologists.
- **Comparative needs**: the need for DC and training was compared with a group of European youth workers having participated in the DICOSP reference study 'Digital Skills for You(th) - skills gap and training needs analysis study' (CONSORTIUM OF THE PROJECT DIGITAL SKILLS FOR YOU(TH) 2018).
- **Felt need:** Felt need is a person's desire to develop personally through education or to achieve certain professional goals. Individual goals are an important motivation for the participation in training programs. The perceived need of SPs for training was

determined via the DICOSP expert interviews and the online questionnaire for SP.

- **Critical incident needs:** Critical incident needs referred to events that were rare but could have a devastating impact. This category of needs played a role in DICOSP in that the DC of SPs was analyzed at the time of the Covid 19 pandemic. This potential crisis caused an increased need of DC in school psychology practice due to school lockdowns and needed to be considered in the needs analysis.

The needs analysis was supplemented by a context analysis. The characteristics of the target group played an important role in the planning and design of training courses. Practicing SPs are not young trainees, but adult learners who have academic training and professional experience. Individuals who are in-service learners must balance numerous professional, social, and family demands. They rely on training that is flexible in terms of space and time to integrate learning times with their commitments. In addition to prior knowledge, the learning context is therefore important for DC acquisition. Several types of contexts can be distinguished. The DiCoSP study considered as context of DC of SP:

- The level of digital development of the countries studied to assess infrastructure as an enabling factor of SP's acquisition and application of digital skills;
- Educational guidelines as well as educational offers of schools, universities, further and continued education institutions on DC to be able to assess possibilities for the acquisition of DC;
- Digitization of the workplace to assess the importance of DC for SPs at work (competence requirements, on-the-job training, informal competence acquisition, digitally competent organizational form);
- The digitization of educational institutions to assess the importance of SP’s DC for their target groups.

In addition, the research interest of the DiCoSP study was to respond to the SSSP/ISPA Grant Award 2021 conditions. Various scientific contributions internationally pointed out a need for research on SP’s DC as well as quality assurance of their services. No empirical study on the need for DC in school psychology practice could be identified at the beginning of the research project. In this respect, DiCoSP entered new territories. By developing a needs-based DC framework, a resource-oriented response to the professional challenges of SPs in the digital age can be provided with the goal of assuring the quality of school psychology work. In the short term, DiCoSP could raise SPs' awareness of the importance of DC in their practice. In the long term, the digital competence framework could provide valuable guidance for SPs and their training providers on needed professional DC and the development of needs-based DC training

opportunities. For example, the European School Psychology – Center for Training (ESPCT) had indicated willingness to include learning modules on SPs' DC in its training program. Due to the transversal nature of DC, the DiCoSP - study targeted a broad audience. The results were relevant for SP (professional development, adaptation to professional challenges of the digital age in their daily work, service quality), education, training and professional development providers and SP professional associations (to adapt curricula and training offers based on a profession-specific structure) and for curriculum and software designers (to develop and provide appropriate digital tools and applications for and with SP). The study has been presented in school psychology conferences/congresses (e.g. ISPA 2021, 2022 - and BUKO conference) and are planned for publication in school psychology journals. DiCoSP has additionally established the website https://dicosp.eu in order to create a long-term platform where

- Interested parties can publish articles on DC in school psychology and thus contribute to a broad discourse on the topic
- Resources on DC are provided, which emerged as a 'by-product' in the development of the DiCoSP – study. This material was meant to empower SPs in their practice.

8.2. LITERATURE RESEARCH

8.2.1. PROCEDURE

The following table illustrates the procedure for DICOSP's literature review:

TABLE 2 *STEPS OF LITERATURE REVIEW*

PROCEDURE	APPLICATION
PROBLEM IDENTIFICATION	The term "digital competence" could not be clearly defined. It encompassed a wide range of terms, concepts and approaches and adjacent terms. In line with the research findings of V. LARRAZ (2013) on digital literacy[1] , the Internet search strategy was extended to include the following terms: Educational psychology/school psychology + digital competence + Media competence + Information and data competence + Knowledge management + Information and communication technology ICT

[1] Larrrraz, V. (2013). La comprtència digital a la universitat, Doctoral dissertation, Universitat d'Andorra, http://hdl.handle.net/10803/113431

	+ Computer competence Educational Psychology/School Psychology + digital skills + digital literacy + digital competences/ competence + media literacy + ICT literacy + computer literacy + information and data literacy/management
LITERATURE SEARCH	The literature search was conducted in the relevant electronic psychology databases (PSYNDEX, Psycharticles, Pub-Med, APA Psycinfo, ZPID) for the period 1977 - 2021. In case of too many publications, a new selection was made into 'not to review' and 'to review'. In case of too many publications, the following inclusion criteria were used: ○ Peer-reviewed journal articles ○ Reports on behalf of international organizations ○ Literature reviews including unpublished/gray literature from government reports, policy statements, conference papers, theses, dissertations, and research reports ○ Only fully published articles in German, English, Spanish, French, Dutch in the period 2000 - 2021.
DATA ANALYSIS	Empirical and theoretical publications were evaluated
DATA ANALYSIS	A thematic analysis was carried out to develop relevant categories
PRESENTATION	Summary of main findings and listing of relevant literature.

The literature search was conducted in June 2021. During that year, a torrent of new publications was added due to the catalytic effect of the Covid 19 pandemic, making it difficult to keep up with the flood of new publications. Therefore, to get an overview, a literature search was conducted again in December 2021. The largest difference between the two survey dates was on APA PSYCHinfo for "Psychology and digital competence" with 23 hits in June 2021 and 172 hits in December 2021, but the search on PUBpsych also yielded 18 hits in June 2021 and 137 hits in December 2021 for Educational/School Psychology + digital skills. Both searches yielded the following hit result overall:

LITERATURE RESEARCH DICOSP	TOTAL
APA PSYC	
APA PSYCinfo, PSYCHOLOGY + DIG. COMPETENCE	**172**
APA PSYCH articles. PSYCHOLOGY + DIGITAL COMPETENCES/ COMPETENCE	**33**
APA PSYCHinfo ART. FULL TEXT EDUCATIONAL PSYCHOLOGY/SCHOOL PSYCHOLOGY + DIGITAL COMPETENCES/ COMPETENCE 2018- 2021	**0**
APA PSYCinfo ART. FULL TEXT EDUCATIONAL PSYCHOLOGY/SCHOOL PSYCHOLOGY + DIGITAL SKILLS	**137**
PUBPSYCH	
EDUCATIONAL PSYCHOLOGY/SCHOOL PSYCHOLOGY + DIGITAL COMPETENCE//EDUCATIONAL /SCHOOL PSYCHOLOGY + DIGITAL COMPETENCE	**169**
EDUCATIONAL PSYCHOLOGY/SCHOOL PSYCHOLOGY + DIGITAL SKILLS	**137**
EDUCATIONAL PSYCHOLOGY/SCHOOL PSYCHOLOGY + DIGITAL LITERACY	**421**
PSYNDEX EDUCATIONAL PSYCHOLOGY/SCHOOL PSYCHOLOGY + MEDIA LITERACY// EDUCATIONAL PSYCHOLOGY MEDIA LITERACY 1977 - 2021//	**258**
EDUCATIONAL PSYCHOLOGY/SCHOOL PSYCHOLOGY + ICT LITERACY//PÄD/SCHOOL PSYCHOLOGY + INFORMATION AND COMMUNICATION TECHNOLOGY IKT	**67**
EDUCATIONAL PSYCHOLOGY/SCHOOL PSYCHOLOGY + COMPUTER LITERACY// EDUCATIONAL PSYCHOLOGY + COMPUTER LITERACY	**43**
EDUCATIONAL PSYCHOLOGY/SCHOOL PSYCHOLOGY + INFORMATION AND DATA LITERACY/ MANAGEMENT//PED/SCHOOL PSYCHOLOGY + INFORMATION AND DATA LITERACY/KNOWLEDGE MANAGEMENT.	**615**
PUBMED	
PUBMED PED./SCHOOL PSYCHOLOGY//EDUCATIONAL/SCHOOL PSYCHOLOGY + DIG. COMPETENCE	**5542**
PUBMED PSYCHOLOGY + DIG. COMPETENCE 1979 - 2021	**1778**

Similarly, AL-BABA's (2022) comparable literature review on SP's use of digital technology in the United Kingdom of Great Britain (UK) yielded no hits on the keywords "technology (including terms such as camera, smartphone, tablet, laptop) and school psychology/ educational psychology" in the University College London (UCL) Google Scholar and Explore database. This study was one of the first in UK to examine the use of information technology in educational psychology practice.

8.2.2. RESEARCH SELECTION

1. First, the titles of all articles found were checked for suitability for the above selection criteria.

2. Then the abstracts of all initially relevant articles were reviewed for eligibility according to uniform criteria. References were selected with one or more of the following keywords: educational psychology/school psychology, school psychological, educational/school psychology/school psychological, psychology in schools/instruction/education, psychology in education/school, psychoeducation/psychoeducational, psychologists/ psychology and schools.

No publications could be identified that concerned a theoretical or empirical analysis of SP's DC in practice, so it was assumed that the DiCoSP - study broke new ground. Most publications referred to:

- Digital user behavior and digital (media) competences of students, teachers, parents
- Digitization and school
- Digital tools in mental health/mhealth
- Online tests in mental health and learning
- Assessment of digital-related risks and digital-related competence
- Digital issues in school psychology/education journals.
- Current online research.

3.Finally, the full text of all remaining publications was reviewed. All articles considered as being relevant were coded in terms of: Authors' name, date of publication, title of publication, journal/publisher, source, main aims, method, results and conclusion, relation to SP's digital issues, to ensure that all articles related to DC in school psychology were selected.

4.The final part of the content analysis process was to explore how school psychological activities could be conceptualized and operationalized to map a comprehensive picture of SP's DC. Based on the coded list, information about the relationship between school psychological activities and digitality was extracted. Data extraction was part of the content analysis process to provide an overview of the main areas of school psychological activities in the digital context. The results contributed to the categorization and operationalization of school psychological activities related to digital issues.

Despite the partially high hit rate, only few publications were related to the topic of "school psychology in the digital context" (Table 3). **Five empirical studies on school psychology activities** with a reference to DC could be identified:

TABLE 3 *Identified empirical studies on School Psychology and Digital Competence*

MAIN OBJECTIVES	METHOD (M)	RESULTS WITH CONCLUSION	REFERENCE TO DIGITAL TOPICS	ASSESSMENT OF BENEFITS FOR DICOSP STUDY
1. Caehill, P.M. (1998). *The use of computer-mediated communications as a means of continuing professional development for school psychologists: A needs assessment*. Ph.D. thesis, State University of New York at Albany; https://www.learntechlib.org/p/128698/ and https://www.proquest.com/docview/304471936				
Determination of motivation level, goals, and possibilities of SP to participate in training measures in the form of collegially guided online conferences	Empirical study using online survey of SP in New York State.	Most SPs expressed willingness to participate in such trainings, with limitations expressed in terms of insufficient computer training and insufficient experience with various computer applications.	Attitude of SP to collegial online training courses	After 23 years of further digital development, the limitations in the use of digital training may no longer exist, so that an update of digital training needs seemed

				warranted.
2. Farmer, R. L., Goforth, A. N., Kim, S. Y., Naser, S. C., Lockwood, A. B., & Affrunti, N. W. (2021). Status of School Psychology in 2020, Part 2: Professional Practices in the NASP Membership Survey. *NASP Research Reports, 5*(3), pp1-17; https://www.nasponline.org/Documents/Research%20and%20Policy/Research%20Center/RR_NASP-2020-Membership-Survey-part-2.pdf				
Findings on the activity profile of US American SPs, especially interest in changes in activities due to the Covid 19 pandemic.	Research report on scientific analysis of results of an online survey of NASP members.	Most SPs were engaged in assessing educational support needs (diagnostics, administration, meetings in the context of the individual support plan); less than 50% of SPs engaged in psychoeducation activities (e.g., in-school training); many SPs engaged in mental health and behavior support; SPs report a need for guidance ○ on the usage of digital health services, especially digital assessments; many SPs express concerns about the use of digital assessments (appropriateness, validity); ○ for quality assurance of effective online counseling and online learning in terms of knowledge acquisition and psychosocial learning. ○ to respond to mental health needs created by the Covid 19 pandemic (trauma, grief). SP also reported a need for support at the federal level to cope with the assessment of special educational needs.	The study provided information about ○ SP work practices using digital resources ○ SP's attitude towards the use of digital resources at work ○ Needs of support for the applicaton of digital resources	Information on the SP's professional use of digital resources under crisis conditions could serve as a template for conceptualizing and operationalizing digital competence and important fields of action in which digital issues play a role Information on support needs could be a basis for assessing SP's training needs
3. Reupert, A., Schaffer, G. E., Von Hagen, A., Allen, K.-A., Berger, E., Büttner, G., May, F. (2021). The practices of psychologists working in schools during COVID-19: A multi-country investigation. *School Psychology.* Advance online publication, https://doi.apa.org/fulltext/2021-73529-001.html				
Recognize how SP in US, Canada, DE, and Australia supported students' mental health during Covid 19 pandemic related school closures. In all countries SPs worked digitally in relation to psychoeducational assessments, virtual counseling, consultation, direct online support for children or parents; significant differences between countries: in Germany and Australia more SPs offered telehealth counseling than in the US and Canada;	Empirical investigation by means of an online survey of SPs	The study concluded that there was a need to ensure that SPs have the appropriate technological skills to support school communities during periods of school closure, e.g. by virtual counseling and the digital administration of psychoeducational assessments.	Information on the professional use of digital resources by SPs under crisis conditions to reach target groups	Information on SP's professional use of digital resources under crisis conditions could serve as a basis for conceptualizing and operationalizing DC The study justified the development of a DC framework as a contribution to

German SPs made greater use of paper material for supporting children than it was the case in all other countries.				the quality development of SP's services.
4. Schaffer, G. E., Power, E. M., Fisk, A. K., & Trolian, T. L. (2021). Beyond the four walls: The evolution of school psychological services during the COVID-19 outbreak. *Psychology in the Schools*, *58*(7), 1246-1265. *Psychology in the Schools*, *58*(7), 1246-1265. https://doi.org/10.1002/pits.22543				
Findings on changes in the activity profile (roles, responsibilities) of American SPs before and after the Covid 19 pandemic.	Empirical study by means of online survey for SP	While before the pandemic, American SPs were most often engaged in diagnostic activities followed by consultation and collaboration, and in third place meetings on individual support plans. After the onset of the pandemic, consultation and collaboration ranked first as professional activity, then attendance at individual support plan meetings, and counseling ranked third. SP provided support promoting the mental health of students and faculty during the pandemic via digital resources. Obstacles in remote work were seen in ○ Digital signature (child/family) of the consent form of SP's services of SP not possible. ○ Work-life balance ○ Child/family did not have adequate internet connection It was believed that the change in the order of activities was because SPs were not required to perform standardized assessments digitally. The study concluded that there was a need for more research on the quality development of digital school psychology services during crisis situations, but also as an additional service offer during non-crisis times.	Information on the ○ SP's professional use of digital resources under crisis conditions ○ Barriers to the use of digital resources in SP's professional activities.	Information on the professional use of digital resources of the SP under crisis and non-crisis conditions as well as on barriers to the use of digital resources could serve as a basis for the conceptualization and operationalization of digital competence. The study justified the development of a digital competence framework as a contribution to the quality development of school psychology work
5. Spilt, J.L., Wouters, S., Frenay, M.,Colpin, H. (2021). Psychologists at work in Belgium: A national study into the field of work of School and Educational Psychology, Leuven: KULeuven/Belgium, https://www.compsy.be/files/Research-Report_School-and-Educational-Psychology_Spilt-et-al-2021.pdf				
To gain an overview of the professional activity profile of the SP in Belgium.	Empirical national study	The most frequent task of Belgian SPs was the support of clients and their environment, the second were administrative tasks followed by support of organizations, psychoeducation in the form of training and educational activities, collegial supervision, conceptual and	The survey informed about SPs' motivation to participate in DC training: 11% of Belgian SPs had participated in	The analysis of the activities could serve DICOSP as a template for the ○ Conceptualization and operationalization of DC and

		management tasks as well as scientific work. The most common activity was counseling and coaching; the second most common was assessment, then prevention, then treatment/therapy; the most common topic was psychosocial development and behavioral activities; the second most common was learning processes and cognitive development, then career guidance; the least common is health promotion; An analysis of activities based on the ISPA (2017) 7-role model was conducted with the result that the interviewed SPs felt most competent in the roles of team workers and professionals, specifically in communicating with students, parents and teachers, in oral and written reporting, in assessing their own strengths and weaknesses, in knowledge about cognitive, social and emotional development of students, in cooperation with external psychologists and educational scientists. Respondents felt least competent in communicating in a foreign language, in knowledge of underlying biological processes of psychological well-being, in critical evaluation of psychometric properties of instruments, and in knowledge of health education. Respondents rated as most important activities communication with students, parents, and teachers, knowledge of cognitive, social, and emotional development of students, reflection on own weaknesses and strengths, addressee-related reporting, and appropriate information and psychoeducation for students, parents, teachers, schools. The respondents rated as least important activities as the critical evaluation of psychometric properties of instruments, the assessment of the quality of scientific studies and results, the knowledge about underlying biological processes of psychological well-being and the knowledge about health education. Key challenges in the profession included: -Confidentiality of data (e.g. when sharing info with other professionals/court).	training on digital competence and 9% were interested; Little use was made of digital opportunities for CPD; ethical and health aspects played a role for SP in the use of digital resources (relationship level in digital communicatio n; health risks for children and adolescents).	important fields of action in which digital topics play a role. ○ Assessment of the training needs of SP

		-Patient records policy -Excessive use of social media (e. g. internet and gaming addiction, cyberbullying...); For self-study most frequently used tools: informative websites, books, journals, scientific articles; scientific blogs were hardly used.		

Several publications could be identified that indirectly mention DC of SPs. They were of value to this study for conceptualizing and operationalizing DC because they gave an indication of the fields of action in which SPs were already working remotely. The publications were categorized as follows:

- Response to the Covid 19 pandemic, i.e. working conditions in crisis mode. Most contributions pointed out ethical aspects and an increase of remote working.
- DC of psychology students providing insight into expected DC of future SPs
- Position of the SP in DT
- Professional ethical aspects of remote working methods
- Learning and teaching theories and methods in the digital context
- Digital tools and methods in educational/school psychology
- School psychology support for the DT of education, especially schools
- Supporting a healthy psychosocial development and health of children, youth/families, and educators in a digital context.

The list of identified publications can be found in APPENDIX 16.

In addition to this systematic literature search, other sources of information that emerged as a result of the systematic search were used unsystematically, e.g., Google search, Semanticscolar.org, Researchgate.net, Academia.edu, Psychology.org.au, Sciencedirect.com, Frontiersin.org. Relevant findings (scholarly, policy, professional, and individual publications) from these searches were included in the bibliography of this study (APPENDIX BIBLIOGRAPHY).

8.2.3. RESULT OF THE LITERATURE RESEARCH

Results of the literature research on the concept of competence are presented in chapter 3 "The construct of competence", as the systematic analysis of the very extensive publications on the topic of "competence" and "DC" would go beyond the scope of this study. The analysis of GUERRERO (2013) visualized main research directions, specialties, and trends on the term "professional competences". Eight groups were found, of which the directions 'competences in the workplace, in the context of technologies, in higher education, in occupational psychology, and

behavioral, cognitive and motivational aspects of competences' were considered for this study.

A literature search by KLIEME/HARTIG on the conceptual field of "competence" showed already in 2007 how ‘explosive’ the topic was and still is in educational science and psychology: *"A current keyword search in the literature database of FIS Bildung yields 8,889 hits for competence, in the database PsycInfo 27,255 hits are found for competence, competency and competences from 1985 onwards - this corresponds to three to four, in recent times even ten publications per day over the entire period. In the past ten years, publications with this keyword have maintained a remarkable share of the total number of psychological publications, while their absolute number doubled*..." (KLIEME und HARTIG 2007a, p.13)

Due to this initial situation, this study was self - limited to the presentation of the concept of competence based on selected relevant concepts and models in the chapter "The construct of competence" and "The construct of digital competence". Relevant selected publications on the topic of "competence" for this study were marked in the bibliography.

The systematic literature review on the topic of "Digital Competences and School Psychology" resulted in the following topic overview, which covered a broad spectrum of school psychology work and indicated how comprehensively DZ affects school psychology:

- SP have been using DT for at least 30 years in almost all professional fields of action, such as assessments, counseling, prevention, intervention, administration, independent training.

- The Covid 19 pandemic has pushed remote work in school psychology practice, so that SPs were using more digital resources than before and responded by changing their practice profiles.

- Training needs in relation to DC were found in survey results on the need for support. SPs expressed demand for support in terms of:

  - Use of digital resources for assessments, counseling, cognitive and psychosocial learning.

  - Response options in circumstances of mental health impairment of target groups under crisis conditions that did not allow for face-to-face contact.

- SP saw several problems in the use of digital resources:

  - ethical, data, scientific (validity), professional, privacy concerns in digital assessments and in digital communication and collaboration with target groups (digital signatures in consent forms; social divide)

- Health concerns (work-life balance; health risks for children and adolescents (increase in excessive Internet use).

- Legal concerns about protecting personal data in the context of school psychology work (sharing personal data with other professionals/the school/the justiciary system, issues surrounding electronic patient/client/student records).

- Concerns regarding quality of work (ability to relate in digital space, loss of trust due to technical/data protection concerns of target groups, discrimination due to digital divide).

- Desire for more research on quality development of remote school psychology work.

Topics of digital-related school psychology work, sorted by digital professional, methodological, social, and personal competence, can be found in APPENDIX 17.

The results of the literature review from the point of view of competence led to the conclusion that

- DC of SPs was required in terms of quality assurance of services given the wide range of school psychology topics related to digital resources.
- Self-competence is an important class of SPs' DC because professional ethics have a high value in school psychology practice.

8.3. FOCUS GROUPS - INTERVIEWS

The instrument of focus group - interviews was used in qualitative research because the moderated and focused discussion in a group offered advantages over individual interviews (SAVIN-BADEN. & HOWELL MAJOR 2013). The exchange and confrontation of perceptions, opinions and ideas stimulated intensive discussion. This appeared to be an appropriate method for DiCoSP because little empirical evidence was available on the topic of DC and it was a generally highly topical issue during the Covid 19 pandemic. The goal of the interviews was to obtain an assessment of the importance of DC from SP, professional use of digital resources, and readiness for further training on DC.

Two groups of exploratory qualitative expert interviews were conducted with individuals from AT (N=2; 1 parent representative, 1 SP), BE (N=1 teacher, 2 SP), D (N=4 SP), CH (N=2 SP), which were tape and video recorded. The selection of the participants (PTPs) represented a convenience sample, as it was not easy to recruit suitable experts during the summer vacations, especially during the Covid 19 pandemic. Thus, Austrian experts were recruited through the Ministry of Culture and through the Federation of European Parents' Associations. Belgian experts were recruited through the employer 'Kaleido-East Belgium'. German experts were recruited through the Ministry of Education of Lower Saxony, the

Hessian Competence Center for SP and through ESPCT. Swiss experts were recruited via the professional association SKJP. Recruitment was based on the characteristic: SP, teacher, students' representative, parents' representative each with experience in working with SP to be able to assess competences and tasks of SP from multiple perspectives.

Two focus group interviews were conducted online, on 8/2/2021 (N=5) and 9/7/2021 (N=6) for 1 ½ hour each. Participants were informed beforehand about the topic and the procedures of the focus groups, with assurances of data confidentiality and confirmed their consent by a signed consent form.

The interview was based on theoretically grounded aspects and was thematically problem-centered and deductively guided by the interviewer. According to the logic of the Grounded Theory (STRÜBING 2008) the interview remained open for questions or new aspects of questions depending on the statements of the interviewees (LAMNEK 2005). In phases, the guideline interview was narrative, i. e. purposefully inductive, and left the interviewee in charge after a suggestion until the interviewer directed the explanations back to a guideline point. The interviewer used the thematic narrative-generating stimuli, deepening activation, reassurance, follow-up questions as interview elements.

The tape-recorded data were transcribed for analysis to allow for the analysis and reconstructing of the latent beliefs of the experts. The transcription was carried out according to the qualitative content analysis of KUCKARTZ (2007). The verbatim transcribed and anonymized interviews were coded using MAXQDA software. The qualitative content analysis according to KUCKARTZ using the technique of theoretical coding led to the following results with four core categories:

1. Increase of SP's remote work in response to crisis

All PTPs reported that the pandemic had brought about a digitization push, in that, for example

- Video conferencing with colleagues, online consultations with clients, and online training among SPs were widespread compared to the past and will continue to be so, according to the participants. There was also talk about the use of e-files and apps.
- SP showed a higher willingness to undergo training of DC.
- There had been increased digital networking among all those involved in schools, with SP experts particularly appreciating cross-regional collegial networking and digital training opportunities.
- The management of work under digital conditions had steadily improved over the course of the pandemic.

Example quotes: *"[...] that it has simply become clear to many people how far behind we were in some cases. As far as the use of digital possibilities and offers is concerned, not as an end in itself, but simply to better organize processes, yes, how far behind we are there, as far as the level of competence is concerned and also the willingness to work with students in this framework."* (FG1, PTP5, free translation)

"Some things went very well there. That was such a mode of trial and error, where you really managed to do things that you wouldn't have thought you could do online." (FG2, PTP1, free translation)

2. Advantages and disadvantages of remote work in school psychology practice

The participants named as disadvantages of the professional use of digital resources:

- Lack of personal, interpersonal relationship
- Digital fatigue and work overload
- Social divide

Example quote: *"So you have an incredible number of sessions online. You couldn't do them in presence at all because you'd always have to travel somewhere in between. It's exhausting. There's such an incredible density, that's a challenge to deal with."* (FG2, PTP5, free translation)

"We miss this informal, social exchange with a cup of coffee. We have now offered a virtual café, which is certainly more of a common model, without a theme, without a structure. I don't think even that fills the need to just go into a corner somewhere with someone you haven't seen in a long time and ask "How are you?" So, because that's still a public space with everyone who's in this virtual café, and not just four of us, six of us, just chatting about something again. That is, I think, actually something that disappears or is difficult to compensate for." (FG1, PTP 4, free translation)

The following advantages were named

- Better compatibility of family and career
- Better accessibility of the clients
- Greater work efficiency (collegial networking, digital training): All participants reported that collaborations were significantly facilitated through digital sharing of documents and collaborations/training using video tools.
- Chance for inclusion

Example quotes:*"[...] the possibility of simply meeting with a national working group for two or three hours. Without digital possibilities, no one will do that, so no one will drive … four hours for two hours of work. So*

that's something that .. I also really hope that it just stays [...]." (FG1, TN4,free translation)

"I mean, in our case, parents sometimes drive three hours from one district to the city. Now we've said we're going to keep doing it digitally, even when it's not even necessary anymore, because we see each other a lot more and we can discuss a lot more and we have a lot more options and we really like that." (FG2, TN6)

Some participants reported that SP have experienced that remote work can be of support for students with special needs.

Example quote: *"For students with anxiety disorders, a lockdown is the best thing that could have happened. They weren't out of line anymore. Everybody was home, and if somebody was trying to actually work on content and not fight every day: am I going to make it to school or not, that was wonderful. But also these expansive candidates who barge in and can't hold back, can't get in touch and are always interrupting, they could just write an e-mail..... Some of them got on much better with it. Or even with hybrid in small groups, we have suddenly seen children who have flourished... very shy children who suddenly saw themselves because the presence of others was not so intense there … Transferring compensation for disadvantages from the classroom into the digital world, from the digital world into the classroom - yes, I think that's wonderful."* (FG2, PTP4, free translation)

3. Prerequisites for remote work in school psychology practice

The participants named the following as building blocks for a further development of remote work in school psychology practice:

- Guidance on what kind of remote work is useful/manageable and justifiable from a data protection perspective
- Development of qualitatively valuable applications of digital resources (durability, privacy, security, serious information).
- Personal competence in the form of readiness for change, of responsibility, of lifelong learning, of taking risks and of fault tolerance
- Introduction of supervision for remote work
- Support from the employer/supervisor/institution
- Change in organizational structure: desirable facilitation of remote working methods within a hierarchical structure
- Multi professional collaboration between SP and IT professionals
- Security in terms of data protection.

Example quotes: *"If you want things to work, you have to take a multi-professional approach, so to speak. You need someone who has the expertise in terms of content, but you also need someone who can*

integrate ... learning games … to make such things appealing so that they are actually used. So ... multi professionality is ... a very central key to making things work well." (FG1, PTP5, free translation)

"[...] what I also observed is simply that there were enormous uncertainties regarding data protection. Am I allowed to do online consultations with BigBlueButton at all? There is a clear statement from the ministry, but it is not interpreted equally in all offices and that makes colleagues uncertain about their options for action [...]." (FG1, PTP4, free translation)

4. Digital competence of SP in practice

All participants found it very difficult to define and assess DC because they saw great regional differences in the way school psychology services work. Technology is one side of DC, but the PTPs were more concerned about DC. The European digital competence framework 'DigComp' offered from PTP's point of view a good framework for SPs' DC, if it were supplemented by the characteristic "critical thinking".

Example quote: *"Everyone should be able to bring something of this with them, master it, know it, and then perhaps aim for a specialization in the area of further training, such as individual case counseling and system counseling... For both fields of assignment, it would be important for me to be able to do this digitally.*

The following focus group contributions have contributed to the construction of the DiCoSP online questionnaire and the digital competency framework:

SP see advantages in remote work (stronger networking and facilitated access and collaboration with addressees and colleagues, facilitated access to continued education opportunities, improved work-life balance) and challenges (lack of personal relationship in digital space, social inequity in access to digital resources, workload due to increasing frequency of contact, digital fatigue, data protection security). The pandemic has contributed to an increase in digitally based professional activities, an improvement in digital empowerment, and a greater willingness to acquire digital skills. Experts assume that the positively experienced effects of remote work will be maintained in the future. The fields of action for digital based working methods were named as follows:

- Collaboration and communication with colleagues (e. g. in the form of video conferences, digital cafés, user of apps, schoolfox, jitsi, conceptboard).
- Online consultation for teachers, parents, pupils, system related consultation

(via BigBlueButton, webex, Microsoft Teams, zoom, whatsapp, Skype, Threema)
- (Individual case) work with students, e.g. for the prevention of media addiction
- Online training of SP / teachers (webex, Moodle)
- Administrative work with e-files and office software, such as Outlook, Word, PowerPoint.

The experts saw the prerequisites for developing remote work above all in:

- Personal competence in the form of readiness for change, responsibility, of interest in lifelong learning, of taking risks and fault tolerance, development of one's own attitude towards digital transformation in the profession, application of agile thinking: what do I need to know in the professional field, where do I find it, how do I find it, how good is it: weighting whether it is important for what I want to do.
- Social competence in the form of building and maintaining of relationships in digital spaces
- Multi-professional collaboration (mix of professional and technical competence)
- Digitally competent organization (regulation of data protection requirements, flat hierarchies)
- Guidelines on remote work (e.g., inventory of best practice, supervision).

8.4. ONLINE QUESTIONNAIRE

The online questionnaires of the DiCoSP study were conducted in accordance with the ESOMAR (2017) International Code of Practice on Market, Opinion and Social Research and Data Analytics.

8.4.1. ONLINE QUESTIONNAIRE FOR UNIVERSITIES, EMPLOYERS AND PROFESSIONAL ORGANIZATIONS

An online questionnaire for universities, employers, and professional organizations potentially offering education and training for SP was published between May 1, 2021 and January 31, 2021 to get a sense of the educational offers on DC for SP in the four countries studied.

Recruitment of participants
All universities as well as academic and professional organizations (BÖP in AT, BDP in DE, SKJP in CH, VVSP/AFAMPS in BE), training SP in AT, BE, CH, DE as well as all persons responsible for school psychology in the Ministries of Culture in AT and DE, in BE at Kaleido-East Belgium, in CH the Intercantonal Association of Heads of Cantonal School Psychological

Services and Educational Guidance Centers were asked by e-mail to complete the questionnaire. In total, N=62 institutions were informed about the online questionnaire with a response of N=20 questionnaires: 5 universities (1 CH, 2 BE, 2 DE), 3 professional organizations and 1 academic training institution (3 DE, 1 AT), 11 employers (1 BE, 1 AT, 9 DE).

8.4.2 ONLINE QUESTIONNAIRE FOR SP

The online survey was developed to obtain information from SP on:

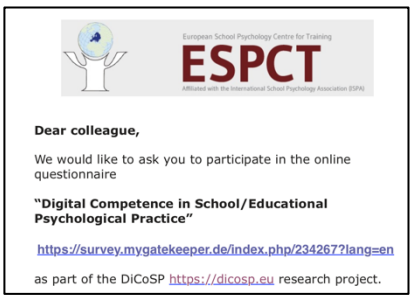
- Perceptions and attitudes toward school psychology digitality;
- Professional use of digital resources and experience of competence;
- Education and training on digital competence.

8.4.2.1 RECRUITMENT OF PARTICIPANTS

Since the DiCoSP study is concerned with quantitative data on the DC of SP in practice, the questionnaire was addressed only to SP. The questions were specifically formulated for SP working in practice. "SP" was defined in the DiCoSP project as follows: *"SPs are psychologists with at least a bachelor's or master's degree in psychology and expertise in the education sector. They work in Europe under different titles such as "School Psychologist", "Educational Psychologist", "Psychological Guidance" or "Psycho-educational Assistant". They are practitioners in school or school-related settings and serve a students' age group of 2-20 years."*

Potential PTPs were informed and recruited

- via professional organizations of SP (in DE via the Section of School Psychology of the Federal Association of German Psychologists BDP as well as the website of the German School Psychology www.schulpsychologie.de,



in BE via the Flemish Association of School Psychologists VVSP and the Association Francophones des Agents PMS AFAPMS, in CH via

the Swiss Association for Child and Adolescent Psychology SKJP, in AT via the Federal Association of Austrian Psychologists BÖP, internationally via ESPCT);
- via employers (in BE Kaleido-East Belgium, in AT, DE via Ministries of Education and Culture, in AT via Centers for Health Promotion in Schools, in CH the Swiss Conference of Cantonal Directors of Education (EDK));
- via training institutions for SP (in AT Austrian Academy for School Psychology, in DE Competence Center Hessen and German Psychology Academy;
- via SP services, being accessible via Internet;
- via mailing lists, personal networks and addresses of SP being accessible via internet;
- via information on the website https://dicosp.eu.

The number of SPs contacted corresponded to an estimated 44% of all SPs in the four states studied (N=1060: AT N=96, BE N=20 DE N=732 CH N=212). SP could participate in the survey regardless of their status (employed, without work, retired...). Any participation was only possible after consent to the information about the content and procedure of the questionnaire.

Incentives to complete the questionnaire were created by

- Information about the intrinsic reward for completing the survey for professional interest in improving one's DC;
- the possibility of a free individual DC assessment by the company GEPEDU. This possibility was used by N=20 SPs.

8.4.2.2 PREPARATION AND EVALUATION OF THE ONLINE-QUESTIONNAIRE

The questionnaire was accessible online via https://survey.mygatekeeper.de/index.php/234267?lang=de November 1, 2021, to January 31, 2022. No attempt was made to increase the number of PTPs because the project was initially limited to 1 year.

The questionnaire was an online, web-based questionnaire administered by using LimeSurvey software. The online - questionnaire (APPENDIX 11), contained two open-ended response ITEMs as well as 33 closed Likert, Ranking, Dichotomous, Check-All-the-Apply response ITEMs on demographic characteristics, employment relationship, education, professional practices, professional and digital competence, attitudes towards DT and remote work, digital infrastructure, training offered and needed, challenges of digital transformation. The 35 question sets consisted of a total of 164 individual questions.

Prior to online dissemination of the survey, a group of practicing SPs (N= 10 SP from AT, BE, CH, DE, F, GB, LUX, NL) from urban and rural settings participated in a pilot test using cognitive interviews to check understanding of the questions asked and to provide feedback on ITEMs, format, missing topics, and length of the questionnaire. The questions were reviewed several times until there was at least 80% agreement among the testing SPs. Feedback received from the pilot test was used to finalize the survey ITEMs.

Adaptive questioning (skip logic) was used to minimize response time. This format allowed a comfortable spatial-temporal response by the respondents, as they could divide the long questionnaire in time and answer it in several rounds. Furthermore, the format allowed automatic switching between question blocks so that the questionnaire could be adapted to the individual situation. Thus, the length of the questionnaire was different for each respondent.

The final online questionnaire was longer than the ideal construction of online questionnaires, with 164 questions and an estimated response time of 30 minutes (REVILLA, OCHOA 2017, GALESIC, BOSNJAK 2009). The DiCoSP study opted for this length despite expected high failure rates to be able to capture as broad as possible a content spectrum of the subject of DC, since it was a pilot project and hardly any empirical results on this topic were available. In addition, the effect of the pandemic was expected to be a motivator to answer questions on digitization. To guarantee an answer to the working hypotheses, important questions were placed at the beginning of the questionnaire.

The survey was created, hosted, and analyzed with the software LimeSurvey which allows online surveys to be conducted without programming knowledge. Survey results could be viewed online during and after survey completion or exported to SPSS or Excel for further analysis. The main data was analyzed descriptively using the Excel program, the Statistical Package for Social Sciences (SPSS*)* and two online analysis programs for the Chi-square tests (Chi-square evaluation program of the University of Oldenburg, http://vilespc01.wiwi.uni-oldenburg.de/cgi-bin/interaktiv/chi/make_chi_table.cgi) and Exact Fishers tests (Fisher test evaluation program of the Norwegian statistics expert Øyvind Langsrud https://www.langsrud.com/stat/Fishertest.htm#INTRO). The open-ended questions were evaluated by the qualitative content analysis according to KUCKARTZ (2007).

8.4.2.3.DATA CLARIFICATION

Country	Estimated number of SP	Response rate of DiCoSP online questionnaires
AT	180	19%
BE (DG)	30	53%
CH	700	8%
EN	1500	9%
Total	2400	12%

TABLE 4 *DiCoSP Questionnaire 2 Response Rate*

Recent studies showed a trend of decreasing response rates for online psychological surveys. A rule of thumb stated that a response rate of 10% was considered as good. Since there was no precise knowledge about the number of SPs in AT, BE, CH, DE, no information was available about the representativeness of the surveyed sample. In this study an estimated population of 2400 SP in all four investigated German-speaking regions is assumed (TABLE 4). The DiCoSP Online - Questionnaire achieved a response rate of N = 282 = estimated 22% of the SP in the four countries (AT N=34=~19%, BE N=16=~53%, CH N=53=~8%, DE N=133=~9%). N=181 SP completed the questionnaire in full length. The completion rate of the survey was thus 64% of all responses received.

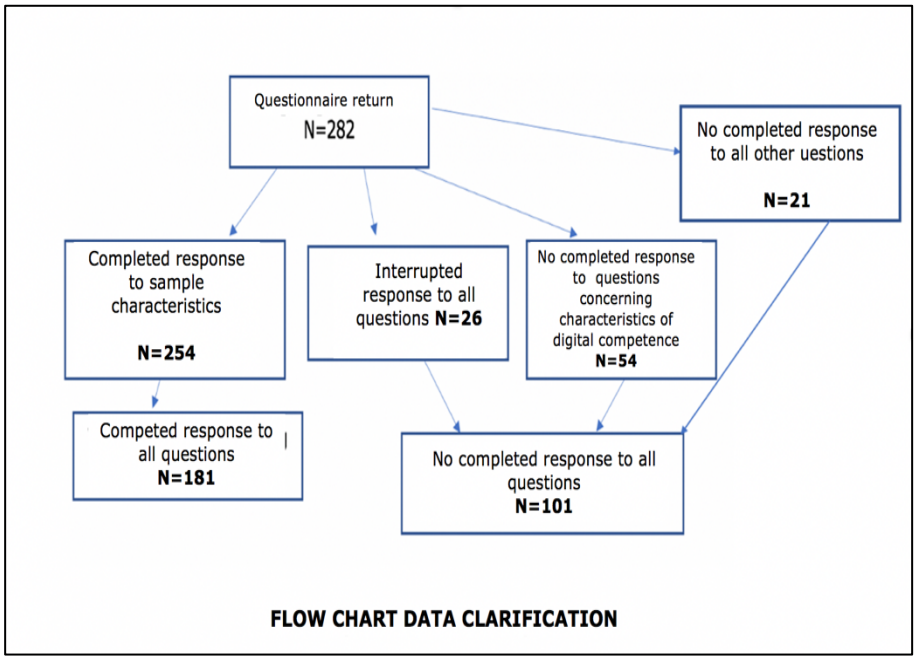


FIGURE 21 *Flow Chart Data Clarification*

TABLE 5 *Questionnaire dropout rate*

ITEM	CONTENT	N= DROPOUTS
1-10 (G1Q00010)	Sample Characteristics	28
From question 11 (G2Q00001) -123 (G200005 SQ013_1)	Change to characteristics of DC - assessment of the importance of DC in practice fields of SPs and digital usage behavior,	80
From question 124 (G200006) - 153 (G5Q00004)	Assessment of own DC and acquisition of DC: How often did you participate in training? Assessment of training formats and digital working methods	90 to 100
From 154 (G6Q00001) 163(G6Q00003)	Change to infrastructure, start: Has your working environment adapted to the digital transformation by	101
164 (G3Q00009) Comments	Open last question with	257

Due to the extensive information of 181 fully completed questionnaires from more than 8% of SPs in AT, BE, CH, DE, a first solid dataset for the analysis of remote practice of German speaking SPs was available. As usual in online questionnaires not all participants answered every question, which lead to fluctuations in response rates between the ITEMs (Figure 21). To miss as little information as possible, fully completed questionnaires were considered for each available response.

The pattern of responses to the questions provided insight into the information content (TABLE 5):

Two response trends could be observed:

- As the length of the questionnaire increased, more and more participants dropped out;
- There were three 'jumps' in the completion of the questionnaire (from question 10 to 11; from question 123 to 124; from question 153 to 154), which were associated with announced **topic changes** (from sample characteristics to DC characteristics, from training to infrastructure) and **personal questions.** Personal questions increased the dropout rate compared to 'neutral questions', e. g. assessment of own digital competence (question 124); frequency of participation in training (question 135); the last question 164 with the highest rate of no response asked for an own comment on the questionnaire and topic. 257 participants did not answer this question.

8.4.2.4. ANALYSIS OF THE SURVEY RESULTS

It is important to keep in mind that SPs who use ICT frequently may be more inclined to participate in the survey than those who do not, which may overestimate the extent of ICT use. This potential bias had to be acknowledged.

A survey captures what respondents say about what they do, not about what they do. To check response validity, respondents were incited to have their DC assessed free of charge by a standardized online EU-DC assessment via specific response links for AT, BE, CH, DE. The offer and evaluation of this competence profile was carried out by the DICOSP - project partner, the company GEPEDU, which had many years of experience and high qualification in the field of job-related assessment. N= 20 SP participated in this assessment. Since the sample was very small, no representativeness could be assumed. The result only indicated a trend for a SP - DigComp profile, which allowed a hypothesis on the correspondence between the profile and the self-reported DC.

In the DiCoSP survey, important digital discipline - specific competences, key competences and digitally related school psychology competences were operationalized in survey ITEMs to obtain a comprehensive overview of SPs' need for DC. APPENDIX 24 provides an overview which ITEMs of the questionnaire were matched with the competence models in a comparable way as well as showing which evaluation respondents made on the importance of DC and on their own DC. The statistical evaluation of the results was carried out by means of descriptive frequency analyses, Fisher's exact test (AGRESTI 2013) and chi-square tests, because most of the data had nominal or ordinal scale level and there were, in some cases, only small samples available.

The LimeSurvey software allowed the questionnaire results to be presented as an Excell table and in the form of percentages and graphs. Descriptive data were presented in this study in tabular and graphical form.

To obtain the most meaningful information possible from the participants, two open-ended questions as well as the ITEM response category "Other," which offered the participants a free response option, were evaluated according to the method of thematic analysis of BRAUN & CLARKE (2006).

Additional Research questions were composed of the following:

- Which characteristics influence the assessment of the importance of DC, own DC, and use of digital resources?
- How can differences between the assessment of the importance of DC in school psychology practice, of one's own DC, and the frequency of use of digital resources be explained?
- Are there differences between respondents in AT, BE, CH, DE in terms of DC and remote work?
- Are there differences in the assessment of DC significance and the use of digital resources between the school psychological fields of activity?
- Which role do key competences for the 21st century play for the DC of the SPs?
- Which are the advantages and disadvantages of the DiCoSP, DigComp, CODE®COMPETENCE ATLAS, ISPA SEVEN ROLE Model in assessing the DC of SP?
- Which role plays digital infrastructure of SP's workplace in DC and skills acquisition?

As the study was extensive, only some relevant topics with the most important results can be presented in this report.

8.5. METHODICAL APPROACH TO THE DEVELOPMENT OF THE DICOSP DIGITAL FRAMEWORK CONCEPT

The process of developing the DICOSP digital competence framework took a total of 13 different steps, which were mastered with the support of a team of psychology students. Relevant texts were analyzed, mentioned competences were noted and categorized according to KAS and PMSP. In sharing the categorizations of each group member, commonalities were incorporated into the final categorizations. The Swiss "Digital Transformation" orientation guide - developed at the Lucerne University of Applied Sciences and Arts - served as a guide for recognizing the digital components of professional skills and for formulating corresponding competence goals. Based on this orientation, assignments of digital and school psychological skills were made.
The 13 steps of the DiCoSP digital competence framework development were the following:

1. The classifications of digital competence classes in PMSP and KAS were theory and consensus–based. The competence model of ROE (2002) in the form of an architectural model and the model of HENSGE, LORIG and SCHREIBER (2009) were chosen as template for the DiCoSP - competence framework.

2. Matching of professional SP profiles with school psychological fields of activities

    2.1. Collection of professional profiles of SP in AT, BE, CH, DE
    2.2. Analysis and summary of the documentation on profiles
    2.3. Creation of a matrix with three school psychological fields of activities: prevention and intervention, diagnostics assessments and evaluation, administration, professional development, and work orientation

    Collection, analysis, and selection of requirements for professional profiles of psychologists/school psychologists in education, training and at work served to

    - develop the "objective" side of the competence matrix by clustering important fields of practice
    - check, whether the matrix offers an appropriate structure for the school psychological practice
    - equip the matrix with practice examples.

    A classification into prevention and intervention was difficult because, for example, consultations can be both a preventive measure and an intervention. Since SPs mainly work preventively, consultations were assigned to prevention.

    SPs work with different target groups/persons that have to be taken into account in the work fields on an individual, group and system level: pupils, parents and guardians, teachers, other pedagogical staff, school management, education officers, school supervisory authorities, the public, the community, research institutions, relevant professional institutions/organizations, colleagues, superiors, professional-political groups, professionals from other disciplines (IT experts, psychosocial care professionals, etc.).

3. Matching of SPs' competence profiles to PMSP competence classes sorted by KAS.

    3.1. Matching of the qualification objectives in the Master's program in School Psychology at the University of Tübingen with the competence classes PMSP

3.2. Matching of learning objectives and competence profile of the MAS of the University of Basel/CH with PMSP and KAS
3.3. Matching of training regulation SP in AT with PMSP
3.4. Matching of IAAP MODEL with PMSP
3.5. Matching of the EQF +ESCO with PMSP
3.6. Matching of the TuningEuroPsy with PMSP
3.7. Matching of the ISPA 7 professional role model according with CanMed to PMSP and KAS.

In order to be able to classify digital-related competences in the context of school psychology activities, relevant competence models of the vocational training and continued education of SPs were analyzed in regard to competence and qualification descriptions according to the grid of vocational action competences of the NQF Vocational Education and Training in CH. The content was matched with the four competence classes PMSP.

4. Matching of the profession-unspecific CODE®COMPETENCE ATLAS with SPs' competence profiles. To be able to consider the key competences of the 21st century, which are considered as a necessary basis for being able to cope with a digitally shaped labor world, in a SPs' digital competence framework, the internationally recognized profession-unspecific CODE®COMPETENCE ATLAS was adapted to the competence profiles in education, further education training and at work of Psychologists and SPs. The result was a competence atlas with sixty important key competences for the SP profession in the classic four competence classes. (APPENDIX 5 CODE®COMPETENCE ATLAS ADAPTED TO PROFESSIONAL PSYCHOLOGICAL PRACTICE.

5. Matching all SP occupational profiles and competence profiles with PMSP and KAS; The work fields were matched with the most frequently analyzed descriptions of occupational requirements as well as qualification and competence goals that apply to all countries studied. (For complete overview, see APPENDIX 14 STEPS TO THE DEVELOPMENT OF THE DICOSP DIGITAL COMPETENCE MODEL).

6. Matching school psychological competences with PMSP, KAS and school psychological fields of practice;

7. Collection, selection, and integration of DC models into a framework of profession-unspecific professional digital competences:

7.1. DigCom Citizen 2.0
7.2. Model LARRAZ
7.3. Model GENNER
7.4. Model SURVIVORS
7.5. Model VAN LAAR
7.6. Competence lab on media competences based on the code competence atlas

8. Matching digital competence models with DigComp's - partial competences (KMK-MODEL, CH vocational education DC, LARRAZ, OBERLÄNDER, VAN LAAR, KOMPETENZLABOR, ISPA STANDARD, GENNER)

9. Matching of digital competence models with an occupation-unspecific framework of professional digital competences categorized according to the competence classes information and data, media, communication, and technology competence.

10. Assignment of the key competences of the CODE®COMPETENCE ATLAS sorted by media competences to PMSP and KAS

11. Assignment of digital professional competences to PMSP and KAS.

12. Adaptation of the ISPA Seven Professional Role Model to SPs' competences in a digital context.

13. The final step was the **development of the digital competence framework for school psychology practice** composed of digitally related PMSP based on competence profiles of SPs' education and training programs and required professional profiles, the adapted CODE®COMPETENCE ATLAS and profession - unspecific professional digital competences. The Swiss 'orientation guide digital transformation' (GUGOLZ & WYSS 2022), developed at the Lucerne University of

Applied Sciences and Arts, served as a compass for recognizing digital components of a professional competence and for formulating corresponding competence goals. Based on this guide, digital professional competences were matched with school psychological competences.

The entire process as well as the respective results of the steps can be found in APPENDIX 14.

The result of this entire transformation process was the DiCoSP digital competence framework for SP in practice consisting of

- the definition of digital competence in SP's practice
- the DiCoSP - architecture model of digital competence
- the DiCoSP - Matrix of digital competence in school psychological practice
- the DiCoSP – Matrix filled with examples in APPENDIX 13.

9. EMPIRICAL INVESTIGATION

9.1. RESULTS OF THE SURVEY ON EDUCATIONAL OFFERINGS

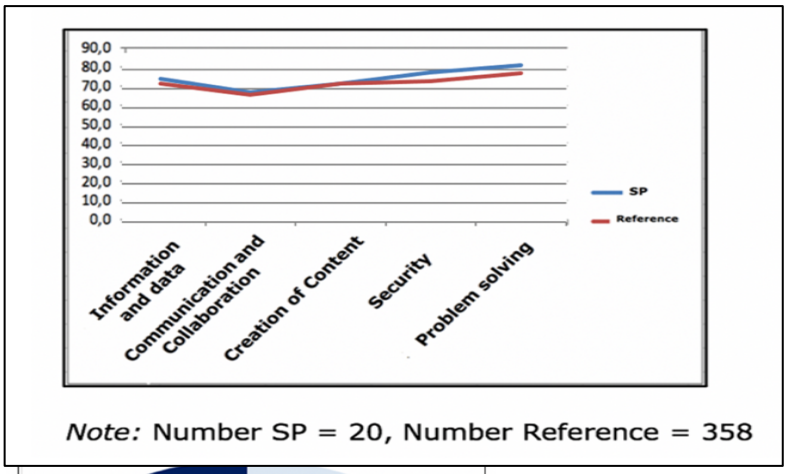
A total of N= 20 questionnaires were completed by five universities (1 CH, 2 BE, 2 DE), three professional organizations and one academic training institution (3 DE, 1 AT), 11 employers (1 BE, 1 AT, 9 DE).

- No institution had a DC profile for SP.
- 3/5 of the universities had training offers regarding DC, at 2/5 of universities, digitally related courses were a curricular component of the educational program. All universities wished to expand the educational offers on DC with internal resources.
- 2/3 of the employers had no educational offers and 2/3 were interested in external training provision to improve DC of SPs.
- The academic training institution and professional organizations offered courses regarding DC and planned to expand their offer with the capacity of their internal staff.

The sample was too small to be able to make valid statements about education and training programs offered for SPs regarding DC in the four German-speaking countries. Overall, the responses indicated that the promotion of DC was currently a topic in demand and that there was no comprehensive educational/training plan for DC of SP.

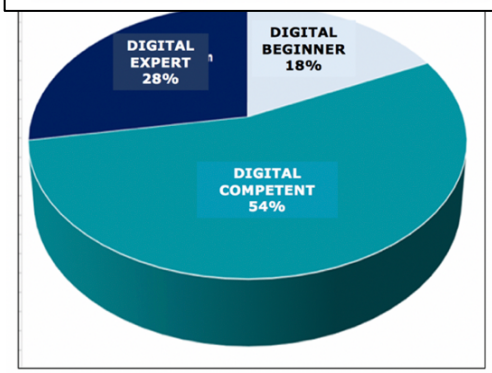
9.2. RESULTS ON THE AVERAGE DIGITAL COMPETENCE PROFILE OF SCHOOL PSYCHOLOGISTS

The average DC profile of SPs was established by a DigComp based online assessment by the GEPEDU GmbH company.



Note: Number SP = 20, Number Reference = 358

FIGURE 22 *Digital Competence Profile of SPs according to GEPEDU Assessment*



Note Number of SP N=20, Number of Reference group N=358

Even though the sample of N=20 SP was small to be able to make valid statements about DC of SPs, a comparison with the results of the GEPEDU reference group of employees with a university degree (N=358) (Figure 22) showed both competence curves being almost perfectly congruent. The achievable maximum was 100% per DigComp class. Almost all results of the participating SPs ranged between 60-80% per competence class, indicating an average or slightly above average DC of SPs.

FIGURE 23 *Percentage of responses on ITEM G2Q00006 Self rated digital competence N = 181*

A comparison with the SP's self - assessed DC in the DICOSP questionnaire *(ITEM G2Q00006)* turned out comparable results. The responses to this ITEM were categorized in 'Digital Beginner', 'Digital Competent' and 'Digital Expert' (Chapter 9.3.3.2. IMPORTANCE OF DC AND SELF-ASSESSED DIGITAL COMPETENCE). The categorization led to the result that 18% respondents saw themselves as digital beginners, 54% as digital competent and 28% as digital experts (Figure 23). Thus 86% of the responding SPs (N=181) felt competent to deal with digital challenges of their job.

9.3. RESULTS OF THE ONLINE SURVEY OF SP IN AT, BE, CH, DE

9.3.1. SAMPLE CHARACTERISTICS

The following nine characteristics were independent variables in this study, with the first seven relating to sample characteristics:

1. Country of the place of work
2. Age
3. Gender
4. Place of work (urban/rural)
5. Size of the service team
6. Place of work (office/school)
7. Management/non-management function
8. Attitude regarding DT
9. Key skills of the 21st century

Overall, the sample had a balanced frequency distribution with respect to most sociodemographic characteristics.

COUNTRY OF EMPLOYMWENT

As there were no official statistics available on the number of employed SPs in any of the countries studied, the representativeness of the sample could not be assessed. In total, N = 282 SPs answered the online questionnaire. The sample represented about 12% of the estimated population of N= 2400 SPs in the four German speaking regions studied. Complete data were provided by N=181 of the respondents, representing a rate of 64% of the sample and 7% of the estimated population. The number of PTPs corresponded with the size of the countries. German SP participated most followed by SP in CH, AT, and BE (TABLE 6).

TABLE 6
Countries of PTP's Employment at baseline (ITEM G1Q00005)

Country of employment	N	%	Estimated number of SP	Quota of SPs participating in DiCoSP online questionnaire
Reply	**N**	**%**	**N**	**%**
DE	133	47%	1500	9%
CH	53	19%	700	8%
AT	34	12%	180	19%
BE	16	6%	30	53%
Other or no answer	46	16%		
Σ	282	100%	2400	12%

GENDER The profession of SP in Europe is a female dominated profession, which was also reflected in the questionnaire with 74% female and 16% male participants (TABLE 7).

TABLE 7
Gender at Baseline (ITEM G1Q00001)

Gender	N	%
Female (AO01)	208	74%
Male (AO12)	46	16%
No answer	28	10%
Σ	282	100%

AGE

The sample covered relatively evenly the age range between 30 years and retirement age (TABLE 8).

TABLE 8
***Age Groups at Baseline** (ITEM G1Q00002)*

Age Groups	N	%
20-29 years (AO01)	26	9%
30-39 years (AO02)	82	29 %
40-49 years (AO03)	65	23%
50-59 years (AO04)	58	21%
60 years +(AO05)	23	8 %
No answer	28	10%
Σ	282	100%

EDUCATION

TABLE 9
***Educational degree of SP at Baseline** (ITEM G1Q00003)*

Highest qualification	N	%
Bachelor Psychology (AO01)	2	1%
Master, Diploma Psychology (AO02)	188	67%
PhD Psychology (AO03)	39	14%
Other	25	9%
No answer	28	9%
Σ	282	100%

67% of the respondents had a master/diploma degree in psychology, 14% had completed their studies with a doctorate and 1% had a bachelor's degree in psychology (TABLE 9).

PROFESSIONAL EXPERIENCE

TABLE 10
***Years of Service** (ITEM G1Q00004)*

Years of Service	N	%
Less than 2 years (AO01)	20	7%
2-5 years (AO02)	36	13%
6-10 years (AO03)	48	17%
11-20 years (AO04)	77	27%
21 years and over (AO05)	73	26%
No answer	28	10%
Σ	282	100%

The length of professional experience was relatively equally distributed among respondents: about 20% with 5 years or less, 17% with 6-10 years, about 27% between 11-20 years, and about 26% with more than 21 years of professional experience. Thus, more than half of the PTPs (53%) were experienced SPs (TABLE 10).

POSITION

TABLE 11
***Professional Position at Baseline** (ITEM G1Q00008)*

Current Professional Position	N	%
Freelance (SQ001)	9	3%
Employed as SP in a service (SQ002)	177	63%
Senior position as SP within a service (SQ003).	45	16%
Employed as an SP in a supervisory agency, e.g., Ministry of Education (SQ004).	25	9%
Other	8	3%
No answer	18	6%
Σ	282	100%

Most respondents (63%) worked in a school psychology service, with 16% in a senior position. 9% worked in a supervisory agency, such as the Ministry of Education, and 3% were working as freelancers (TABLE 11). For statistical reasons, it was useful to group them into 'employees of a school psychological service' (63%) and 'employees in a

management position' (managerial position, supervisory authority = 25%), to be able to differentiate whether SP with and without management tasks had a different view of DC and
training needs of SP (TABLE 12).

TABLE 13
Adapted Professional Positions at Baseline (ITEM G1Q00008)

Current Professional Position	N	%
Employees as SP in a service	121	67%
Senior position as SP within a service and employee as SP in a supervisory authority, e.g., Ministry of Education	53	29%
Other (freelancers, pensioners..)	7	4%
Σ	181	100%

WORKPLACES

TABLE 12
Workplaces of SP at Baseline (ITEM G1Q00007)

Current Workplace	N	%
Schools (KG, PS, SS, VS, SS)	47	26%
Center/service responsible for schools (e.g., school psychology service) (SQ006).	107	59%
Government agency (ministry of education directorate, etc.) (SQ009)	22	12%
Other (educational counseling centers, health care facilities, education and training center, own practice, university, professional organization...) (SQ008)	5	3%
Σ	181	100%

For evaluation purposes, it was convenient to group the workplace situation into 59% of respondents working in a school psychology service and 26% of respondents working in educational institutions (secondary schools, elementary school, special schools, nurseries, vocational schools). This distinction was relevant for the analysis of whether SPs working in closer contact with students at schools use digital resources more often than SPs who were spatially more distant from students (TABLE 13).

NUMBER OF STAFF

Most PTP worked with a staff sized of 6-10 persons (31%) and 11-30 persons (27%). 14% worked in a staff group with less than 6 persons, while 12% worked in a large staff group of over 30 persons. 4% of the respondents worked alone.
For evaluation purposes, it was convenient to group the sample into "small" (up to 5 people = 18%), "medium" (6-10 people = 31%), and "large" staff groups (11+ = 39%) to be able to analyze whether the use of digital resources was influenced by the size of the service (TABLE 14).

TABLE 14
Number of Staff at Baseline (ITEM G1Q00009)

Number of Staff	N	%
Alone	12	4%
1-5 people	40	14%
6-10	88	31%
11-30	76	27%
30+	35	12%
Other	2	1%
No answer	29	10%
Σ	282	100%

URBAN/RURAL AREA

TABLE 15
***Geographical situation at Baseline** (ITEM G1Q00006)*

Geographical structure of workplace	N	%
Predominantly rural	67	24%
Intermediary	92	33%
Predominantly urban	91	32%
Other	4	1%
No answer	28	10%
Σ	282	100%

The workplaces were relatively evenly distributed among urban (32%), rural (24%), and intermediate (33%) regions (TABLE 15).

WORKING TIME

The sample achieved a nearly equal distribution of full-time (46%) and part-time (42%) respondents (TABLE 16).

TABLE 16
***Work Time at Baseline** (ITEM GQQ00010)*

Work Time	N	%
Full-time	129	46%
Part-time	118	42%
Job Search	1	1%
Retired	4	1%
Other	1	1%
No answer	29	9%
Σ	282	100%

9.3.2. RESULTS OF DESCRIPTIVE STATISTICS ON KEY HYOTHESIS

1. Hypothesis: SP consider DC as being important in their professional practice

Acceptance criterion: at least 75% of respondents agree with the statement "Digital competence is rather/very important in my daily work "(*ITEM G2Q00001).*

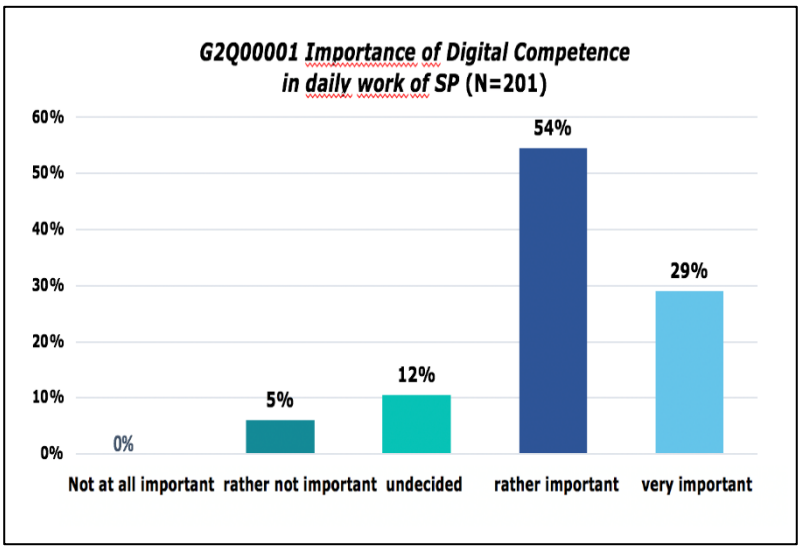


FIGURE 24
Frequency of responses on ITEM G2Q00001 Importance of DC in SPs' daily work

83% of the respondents (N=201) found DC very important or rather important in their daily

work (FIGURE 24). 12% were not sure if DC was important in their professional practice and 5% did not find DC important in their professional practice. Thus, the criterion for accepting the hypothesis was fulfilled.

2. Hypothesis: SP use digital resources in their work

Acceptance criterion: at least 75% of respondents chose the response "At least 1x or several times per day" of ITEM G2Q00002: *"How often do you use the Internet in your daily work?"*

***G2Q00002* How often do you use the Internet in your daily work?**	**N**	**%**
1x per day	12	6%
Several times per day	180	89%
1x per week	1	1%
Several times a week	9	4%
∑	202	100%

TABLE 17
Frequency table Use of internet in SP's daily work ITEM G2Q00002

95% of the respondents used the Internet daily in their professional practice, so the criterion of 75% was met. It could be assumed that the use of digital resources is a normality in SP's practice (TABLE 17).

3. Hypothesis: SP have a need to develop their digital competence

Acceptance criterion: at most 25% of the SPs surveyed chose "*no need for digital competence acquisition".*

TABLE 18 *Frequency table Need for digital skills acquisition ITEM G3Q00003*

G3Q00003 SQ003 I have no need for digital skills acquisition N=181v		
Reply	Frequency	Frequency %
Yes	18	10%

The criterion was met as only 10% of respondents indicated to have no need for digital skills acquisition (TABLE 18). It was very likely that most SPs needed digital competence acquisition.

4. Hypothesis: SP consider the training offerings on digital competences to be insufficient

Acceptance criterion: at least 75% of respondents answered "rather insufficient/not available" in response to the question: "How would you rate the training on digital skills offered in your work environment?"

TABLE 19
Frequency of responses Need for digital skills acquisition -ITEM G3Q00007

G3Q00007 How would you rate the training offered on digital skills in your work environment?	**N**	**%**
Oversupply	1	1%
Just right	36	19%
Rather insufficient	81	43%
Not available	29	16%
I cannot judge	40	21%
∑	187	100%

The criterion was not met, as 59% of the respondents considered the training offers on DC to be insufficient or non-existent. However, 21% could not assess the offer. 19% stated that the training offer was suitable. Overall, the training offer was either insufficient or unknown for 80% of the respondents (TABLE 19). Thus it can be assumed that improved information on training offers could facilitate the acquisition of DC.

The results on the central hypotheses of the DiCoSP study indicated that DT was part of the professional life of German-speaking SPs in Europe. Most SPs valued DC and expressed an interest in improving their DC. SP's access to DC training seemed to be in need for improvement. These results justified research of DC in School Psychology.

9.3.3. IMPORTANCE OF DIGITAL COMPETENCE IN SCHOOL PSYCHOLOGY PRACTICE

To be able to assess SP'S DC needs, the surveyed SP were asked to estimate the importance of DC in 17 action fields of school psychology practice. They were also asked to estimate their own DC.

9.3.3.1. ASSESSMENT OF THE IMPORTANCE OF DIGITAL COMPETENCE IN SCHOOL PSYCHOLOGY FIELDS OF ACTION

Knowing that 83% of the respondents found generally DC important in their daily work *(ITEM G2Q00001),* it was interesting to determine, whether SPs assessed the importance of DC differently in the various fields of work. The result could indicate if a categorization in fields of work was necessary in a digital competence framework. ITEM G2Q00004 addressed this question concerning 17 fields of work: *How important is digital competence for you in the following work fields (very important- rather important- rather unimportant- not important at all) and how often do you use digital resources in the corresponding work field (never - occasionally- frequently)?*

ITEM G2Q00004 Percentage of responses finding DC rather/very important and use of digital resources (occationally/frequently) N=187	% Importance of DC	% Use of digital resources	Difference of percentages between % Assessment of Importance and use of digital resources
Own training	94	85	-9
Administration	90	91	+1
Communication with target groups	89	94	+5
Collegial collaboration	87	95	+8
Report creation	87	90	+3
Training of pedagogical staff	86	85	-1
Support for pedagogical staff	85	90	+5
Psychoeducation	80	84	+4
Counselling	77	92	**+15**
Support parents	76	84	+8
Public information on SP issues	76	65	**-11**
Evaluation of projects/services	69	62	-7
Health promotion	64	59	-5
Assessment	61	59	-2
Learning support	58	43	**-15**
Crisis intervention	57	59	+2
Treatment/therapy	49	48	+1

Table 20 *Percentage response frequency on ITEM G2Q00004 and percentage of difference between estimated importance of DC and use of digital ressources in work fields (frequently/occasionally)*

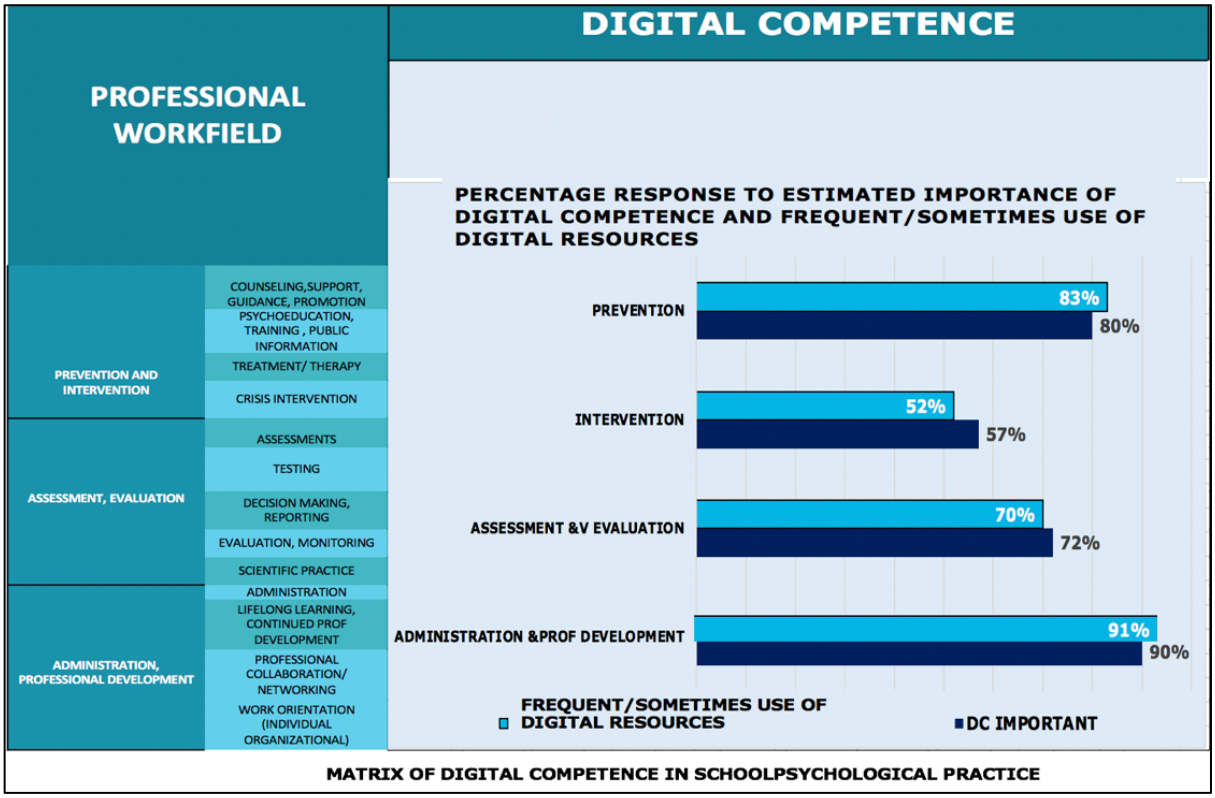
The results (TABLE 20) indicated that there were differences in the estimated importance of DC as well as in the usage of digital ressources among the 17 action fields. While at least three quarters of the PTPs attributed DC to be important in the areas of administration, preparation of reports, training (own and pedagogical staff), transfer of school psychological knowledge (psychoeducation, information of the public) as well as in communication and cooperation with parents, teachers, staff (communication with target groups, collegial cooperation, support of pedagogical staff, and parents, consultation), more than one third of the respondents did not consider DC to be important in the areas of evaluation, health and learning promotion, assessments, crisis intervention. About half of the PTP did not consider DC to be important in the work field treatment/therapy.

Figure 25 summarized the results. The answer 'important' included 'very important' and 'rather important' whereas the answer 'unimportant' included 'rather unimportant/not important at all'. The term 'frequency of use' included the answers "frequently" and "occasionally". Due to a clear difference in digital usage between work fields relating more to prevention or intervention, the work field treatment/therapy, crisis intervention, health promotion and learning promotion were categorized as "intervention", while all other six fields (support for parents and educational staff, counseling, training for educational staff, information for the public, psychoeducation) were classified as "prevention".

On average across the 17 work fields, 77% of respondents considered DC to be important: 90% in administration/professional development/work orientation, 80% in prevention, 72% in assessment/evaluation, 57% in intervention. While the significance of DC seemed to be most controversial in the work field of intervention, the importance of DC in the work field

administration/ professional development/work orientation seemed to be almost undisputed.

FIGURE 25 *Distribution of response frequency on ITEM G2Q00004 per work field: estimated of DC as important and frequent or occasional use of digital resources in work fields, N=189*



There was a parallelism between the assessment of DC and the use of digital resources in the work fields. Most respondents used digital resources in administration/professional development (91%), followed by prevention (83%), assessment/ evaluation (70%) and intervention (52%). The relationship was reflected in Figure 22, which showed the difference (gray line) between assessed DC as important (blue line) and (frequent + occasional) use of digital resources (red line) in the various work fields.

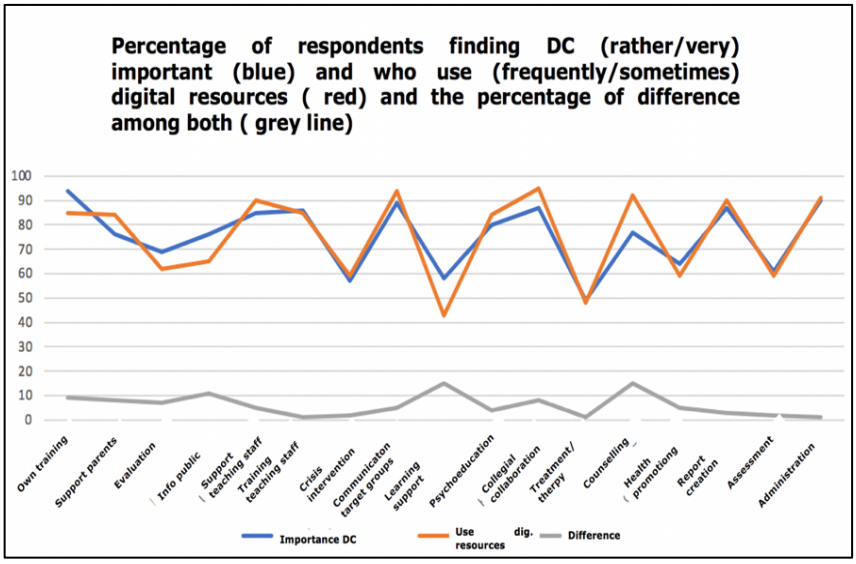


FIGURE 26: *Comparison percentage frequency of responses considering DC as being important (blue) and frequent/occasional use of digital resources (red) and difference (grey line)*

The biggest difference (of 15% was in the field of 'learning support' (58%:43%)

and 'counseling' (77%:92%). Whereas in learning support, more SPs considered DC to be important than SPs were using digital resources, more SPs used digital resources in counseling than SPs considered DC to be important. This result was possibly a pandemic effect (detailed analysis in chapter 9.3.5.4. DC in counseling and assessment).

Based on several significance tests, it could be assumed that

- both the estimated importance of DC and the use of digital resources were not independent of the school psychological field of work;
- the use of digital resources was not independent of the estimated importance of DC in most work fields of SP.

Significant statistical relations were found between

- **the estimated importance of DC and the work field** (prevention, intervention, assessments and evaluation, administration/ professional development/ work orientation) (APPENDIX 23 SIGNIFICANCE TEST 1). Since chi-square tests do not provide information about the direction of a statistical relation, the results needed interpretation. It could be assumed that more SP consider DC as being important in the work fields administration and professional development/prevention/assessment and evaluation than in the work field intervention, where the frequency distribution of responses is more balanced between the assessment of DC as being important/not important.
- **the use of digital resources and the work field** Differences in the use of digital resources among the work fields were not accidently (APPENDIX 23 SIGNIFICANCE TEST 2). It can be assumed that more SPs use digital resources in the work fields administration and professional development/prevention/assessments and evaluation than in the work field of intervention, which showed a more balanced distribution of the DC assessment as important/not important.
- **the estimated importance of DC and the use of digital ressources.** A statistically significant relation could be identified between
  - the use of digital resources and estimated DC in 16 work field except for learning support.
  - the estimated importance of knowing electronic tests and using electronic tests (APPENDIX 23, SIGNIFICANCE TEST 3)
  - the estimated importance of DC in collegial case work with digital tools and the use of digital tools in collegial collaboration (APPENDIX 23, SIGNIFICANCE TEST 4).

Although the results had to be interpreted with caution due to some small samples, the consistent trend of statistical significance gave reason to assume that **the relationship between estimated importance of DC and the use of digital resources in school psychology practice was valid. The data suggested that more SPs who consider DC to be important use digital resources than SPs who do not consider DC to be important.** A DC framework only makes sense if the appreciation of DC also contributes to the use of digital resources in professional practice. In this respect, the result of a statistically significant connection between the assessment of DC importance and digital use in professional practice supported the justification of a DiCoSP digital competence framework and MARTIN's (2008) assumption that DC is a key to digital work culture (Figure 3).

Since DiCoSP was an international study, the question arose as to whether the differences in assessed DC importance and digital usage could be subject to cultural influence. Figure 27 shows the percentage of respondents per country who considered DC to be important in their daily practice (100% of Belgian, 84% of German, 82% of Swiss and 77% of Austrian respondents).

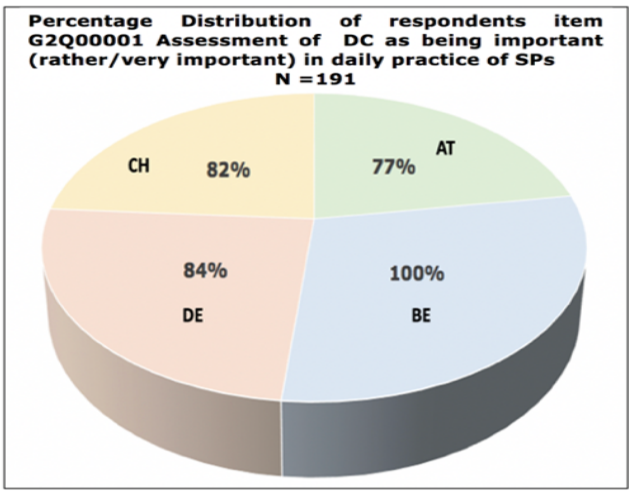


FIGURE 27*:*
Percentage response frequencies per country on ITEM G2Q00001 – Digital competence is very/rather important in my daily work

No statistically significant difference was identified in response frequency of assessed DC importance (ITEM G2Q00001) in general among the countries of employment (ITEM G2Q00004). The general assessment of DC importance in school psychology practice was equally distributed among SPs of AT, BE, CH, and DE *(APPENDIX 23 - SIGNIFICANCE TEST 5).*

TABLE 21*: Percentage of response frequencies of PTPs from AT, BE, CH, DE on ITEM G2Q00004 - DC is rather not/ not at all important in daily practice*

ITEM G2Q00004 Percentage of response frequencies on DC importance considered to be rather not/not at all important in daily practice/ ITEM G1Q00005 Country of work N=189	DE%	AT%	CH%	BE%
Treatment/Therapy	52%	47%	57%	33%
Crisis intervention	46%	67%	46%	33%
Learning Support	39%	50%	51%	17%
Assessments	42%	50%	28%	17%
Health Promotion	29%	47%	46%	17%
Couseling	9%	23%	54%	42%

TABLE 21 shows the percentage of response frequencies among PTPs from AT, BE, CH, DE on the DC assessment as unimportant (rather not/not at all important) in the work fields crisis intervention, learning support, assessment, counseling, treatment/therapy, and health promotion. Only those work fields were considered showing at least 45% ratings as "unimportant" in at least one country. Though in general the estimated importance of DC in SP's daily practice seemed to be equally distributed among the countries studied, TABLE 21 showed remarkable differences among SPs of AT, BE, CH, DE in their estimated importance of DC in various work fields. Differences in the estimated importance of DC among work fields could be identified for example in the two important school psychology work fields of 'counseling' and 'assessment' (APPPENDIX 27 SIGNIFICANCE TEST 6 AND 7).

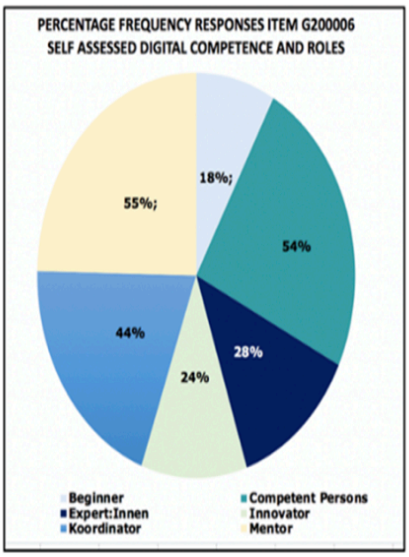
The estimated importance of DC in counseling was distributed statistically significantly unequally among SP from AT, CH, and DE. More SP from CH than SP from AT and DE seemed to find DC in counseling not important. This result could also be identified in responses to the estimated importance of DC in digital collegial casework (APPPENDIX 27 SIGNIFICANCE TEST 8). More SP from CH than from DE seemed to estimate DC in digital collegial casework as being unimportant. In contrast, the estimated importance of DC in the work field of assessments was equally distributed among SP from AT, CH, and DE (APPENDIX SIGNIFICANCE TEST 7).

The importance of DC was therefore assessed differently in the various fields of school psychology, so that it could be assumed that the **importance of DC is situation-dependent and subject to cultural influence.** This finding confirmed the structure of the DiCoSP digital competence framework, which linked subject-related DC to school psychology work areas as a situational reference to professional acting. The comment of a DiCoSP respondent on the need for digital training underlined this concern: *"I would need on-the-job training that is more situational and occasion - related."*

9.3.3.2. IMPORTANCE OF DIGITAL COMPETENCE AND SELF-RATED OWN DIGITAL COMPETENCE

ITEM G2Q00006 (Figure 28) examined the respondents' self - rated own DC and their own role attribution to digitally related work. To be able to break down the self - rated competence levels per country with a sufficiently large sample, the answer options were categorized as 'digital beginner', 'digital competent person' and 'digital expert' (according to the Model of DREYFUSS et al. 1980), whereby the highest mentioned competence level was considered for each PTP.

Item G2Q00006 Estimated own DC N=181	Digital role	Percentage of response frequency %
I am not using any digital resources in my job and I am not familiar with them	Beginner	18%
I am starting to familiarize myself with digital resources	Beginner	
I now some digital tools, software and applications and also use them in my job	Beginner	
I can deal with digital challenges in my job as required	Competent Person	54%
I can easily master digital requirements of my job and I contribute to the digitalization of my professional environment due to my high level competence	Expert	28%
I regularly enjoy introducing new digital procedures or tools at my workplace	Innovator	24%
I support my professional environment in applying digital working methods appropriately and as required	Coordinator	44%
I enjoy helping my colleagues solve digital problems	Mentor	55%



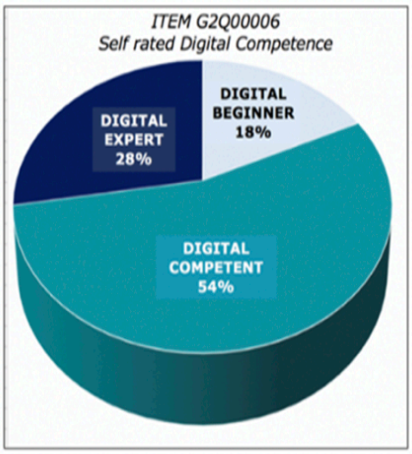


FIGURE 28: *Percentage of responses on ITEM G2Q00006 Self assessed DC and roles*

18% considered themselves to be digital beginners, 54% to be digitally competent and a third of respondents to be digital experts. The results indicated that 83% of SP felt competent, to cope with the digital challenges in their job as needed. About a quarter of the respondents considered themselves as being digital innovators in their job (= key competence of taking initiative/entrepreneurship), 44% as being coordinators by supporting the work environment to efficiently implement remote work (= key competence of result-orientation/helpfulness). More than half of the respondents (55%) indicated their willingness to help their work environment as a mentor to overcome problems due to remote work (= key competence of willingness to help; technological competence of problem-solving ability; digitally related social competence).

The self - rated own DC was among SPs in AT, CH, DE almost equally distributed with about 20% beginners, 50% competent and 30% experts (TABLE 22). An exception was BE without having digital experts and a relatively high rate of digital beginners compared to AT, CH, DE. This result of self – rated DC was consistent with the results on the average digital profile of SP by the GEPEDU assessment, which indicated an average to above-average DC of SPs.

TABLE 22 *Percentage distribution of self - rated DC levels in ITEM G2Q00006 per country of employment*

ITEM G2Q00006 Subjective assessment of DC/ITEM G1Q00005 Country of employment N= 180	% Beginner	% Experts/ Competent	% Experts
AT N=31	16%	55%	29%
BE N=12	42%	58%	0
CH N=35	20%	51%	29%
DE N= 102	23%	51%	26%

Several significance tests could not identify a statistically significant relationship neither between the self-rated own DC and the country of employment AT, CH, DE (APPENDIX 23 SIGNIFICANCE TEST 9) nor between the self-rated own DC in applying electronic tests and the country of employment AT, CH, DE (APPENDIX 23 SIGNIFICANCE TEST 10). Thus, **it was assumed that self-rated DC was equally distributed among the SP of the studied countries**.

A comparison of the results on the self - rated DC and the assessment of DC importance should provide information on whether there was a relationship between both characteristics. It could be assumed that a self-rated high DC level tended to lead to DC being valued more frequently in school psychology practice than a self-rated low DC level. The significance test showed no statistically significant relation between the self-assessed own DC level and the assessed importance of DC in the daily practice (APPENDIX 23 SIGNIFICANCE TEST 11). It could be assumed that the

assessment of DC importance in the school psychology practice was **independent from self-rated own DC levels**.

9.3.4. DIGITAL USAGE IN SCHOOL PSYCHOLOGY PRACTICE

The use of digital resources of surveyed SPs was examined by two ITEMs:

- *ITEM G2Q00002SQ001 How often do you use the Internet at work? (Several times per day, 1x per day, Several times per week)*
- *G2Q00004 How often do you apply digital resources in the appropriate work field in your practice? (Never-Occasionally-Frequently)*

9.3.4.1. DIGITALE USAGE AND WORK FIELDS

As mentioned before, 95% of the respondents used the Internet at least 1x a day for work. TABLE 23 showed the percentage of respondents using digital resources frequently, occasionally, or never in 17 work fields. On average across all 17 school psychology work fields, 76% of the respondents used digital resources: 30% frequently, 46% occasionally, and 24% never. The GEPEDU analysis confirmed this distribution by stating that 76% of the participants showed a positive attitude towards the use of digital technologies. Compared to the reference group of employees with a university degree of 83%, this result was slightly below-average.

ITEM G2Q00004 Do you use digital resources in 17 work fields of your practice?/ ITEM G1Q00005 Country of employment	Frequent (F)%	Occasionally (O)%	Frequent and Occasional (F+O)%.	Never %
ALL N=187	**30%**	**46%**	**76%**	**24%**
AT N=29	27%	41%	68%	32%
BE N=12	36%	48%	84%	16%
CH N=40	25%	50%	75%	25%
DE N=106	33%	44%	77%	23%

TABLE 23
Percentage of respondents of AT, BE, CH, DE using digital resources across SP's 17 work fields frequently/occasionally/never

The average assessment of DC as being important in all 17 work fields as well as the frequent and occasional use of digital resources in these school psychology work fields was comparable with 77%:76%. In the field of 'administration and professional development' 91% of the respondents used digital resources frequently or occasionally, in 'prevention' 83%, in 'intervention' 52% and in 'assessments and evaluation' 70% (Figure 25).

On average, the most common work fields with use of digital resources with at least 90% were

- administration (including report writing)
- communication with target groups
- collegial collaboration
- counseling and
- support of educational staff.

No digital resources were used in the work fields assessment by 41% of the respondents, in health promotion by 41%, in crisis intervention by 41%, in treatment/therapy by 52% and in learning support by 57%.

These findings were consistent with results of the AL BABA study (2022) on digital work of British SPs: *"Overall, EPs used IT very frequently for their main administrative tasks including report writing, accessing resources, research, and communication with other professionals and parents. EPs also used IT frequently for scoring assessments. Most EPs reported that they never used IT for administering assessments ..."* (AL BABA 2022, p.87)

It should be noted that, on average, at least 40% of the DiCoSP respondents used digital resources professionally in each work **field.** Thus, it can be assumed that **digital transformation was of concern for all areas of school psychology.** Only the use of digital resources in crisis intervention by 28% of Austrian respondents, in learning support by 32% of Swiss respondents and in treatment/therapy by 36% of German respondents was lower. This result supported the statements by METZ & SPIES (2020) and EICHENBERG & KÜHNE (2014), that the internet is used across the entire spectrum of psychological practice.

9.3.4.2. DIGITAL USAGE PER COUNTRY OF EMPLOYMENT AND WORK FIELD

Belgian respondents used digital resources the most (84%) across the 17 work fields, followed by about three-quarters each of German and Swiss respondents (73% and 77%) and 68% of Austrian respondents (TABLE 23). Conversely, Austrian respondents led the group of SPs who never used digital resources on average across the 17 work fields (32%.) Figure 29 shows a country comparison regarding the percentage of respondents in who **never used** digital resources (categorized by 50% - 100%, 49%-11% and 0%-10%):

FIGURE 29 *Percentage of respondents in AT, BE, CH, and DE never using digital resources in SPs' work fields*

G2Q00004 In which work field do SPs never use resources?N=189	AT	BE	CH	DE
At least 50% of respondents do not use digital resources in these fields of action	Crisis intervention (79%) Learning Support (59%) Public Information, Evaluation, Health promotion (52% each)		Learning support (67%)	Treatment/ Therapy (64%), learning support (55%), assessments (50%)
Between 11-49% of respondents do not use digital resources in these action areas	Assessments (41%), treatment/ Therapy (41%), owr training (34%) support for parents (20%), psychoeducation (28%), support for pedagogical staf (20%), counseling (13%),	Crisis intervention and learning support (34% each), own training, training of pedagogical staff, psychoeducation, information from the public, treatment/therapy (25% each), health care (25% each). promotion (23%), assessments (17%),	Crisis intervention, health promotion (41% each), crisis intervention (33%), public info (31%, administration, report writing (14% each) parental support (12%)	Evaluation (40%), Health promotion (39%), crises intervention (33%) Info of the Public 31%, administration, report writing (each14%), parent support (12%),
Between 0-10% do not use digital resources in these action areas	Preparation of reports (10%), communication with target groups (7%), Collegial cooperation, administration (0% each)	Communication target groups, counseling, support for parents, evaluation (8% each), administration, Creation of reports, collegial cooperation (0% each)	Psychoeducation (10%), Support for pedagogical staff (6%), Counseling (5%), Own training (4%), Training for pedagogical staff (4%), Collegial cooperation (2%), Communication with target groups (2%)	Psychoeducation (10%), and support for pedagogical staff (6% each), counseling (5% each), own continuing education and continuing education for pedagogical staff (4% each), collegial cooperation and communication with target groups (2% each),

These findings were consistent with results of the AL BABA study (2022) on digital functioning of British SPs: *"Overall, EPs used IT very frequently for their main administrative tasks including report writing, accessing resources, research, and communication with other professionals and parents. EPs also used IT frequently for scoring assessments. Most EPs reported that they never used IT for administering assessments ..." (*AL BABA 2022, p.87)

Broken down by country of the workplace, the significance test produced a more differentiated picture of the use of digital resources. As with the assessment of the importance of DC, no statistically significant relationship was found between the country of employment and the average frequency of use of digital resources across all 17 work fields (APPENDIX 23,

SIGNIFICANCE TEST 12). But statistically significant was the relationship between the country of employment and

- the frequency of digital usage in treatment/therapy (APPENDIX 23, SIGIFICANCE TEST 13). It could be assumed that more German SP than Austrian and Swiss SP were not using digital resources in treatment/therapy.
- the use of electronic test procedures (APPENDIX 23, SIGNIFICANCE TEST 14). It could be assumed that more SP in CH then in AT and DE are using electronic test procedures.

Due to small sample numbers, the significance test results needed to be interpreted with caution. Nevertheless - as with the assessment of the importance of DC - there was a clear tendency of statistically significant different use of digital resources in some school psychological work fields between the respondents of the four countries studied. **It could be assumed that also the use of digital resources in school psychological practice was influenced by the particular work context** (APPENDIX 23, SIGNIFICANCE TEST 2) **and culture** (APPENDIX 23, SIGNIFICANCE TEST 13,14). The German SP's lower use of digital resources in treatment/therapy could possibly be explained by the fact that their professional requirement profile was centered on prevention. Therapeutic activities were not part of their professional responsibility. In Switzerland, however, the job profile of SPs included "guidance, counseling and treatment of the closest reference system of children and young people"[2]. For a comprehensive digital competence framework, this in turn meant that it should contain a broad spectrum of work fields for orientation, from which digital competence profiles could be selected according to professional context-related requirements and put together in a modular manner as needed.

9.3.4.3. DIGITAL USAGE AND SELF-ASSESSED DIGITAL COMPETENCE

A comparison of the self - rated DC and the use of digital resources should provide information as to whether for example a higher level of DC leads to a more frequent use of digital resources in professional practice.

No statistically significant relationship was found between the two characteristics of

- "3 levels of self-rated DC" and "frequency of use of digital resources in the work fields of collegial collaboration, assessment, treatment/therapy (TABLE 30, APPENDIX 23, SIGNIFICANCE TEST).

[2] https://www.zuepp.ch/vskz/

- “Self-rated DC in collegial casework” and “Use of digital resources in collegial casework” (APPENDIX 23, SIGNIFICANCE TEST 16)
- “Self-rated DC in protecting technically confidence in digital counseling” and “Use of digital resources in counseling” (APPENDIX 23, SIGNIFICANCE TEST 17).

This result was comparable to the findings of no identified relation between estimated importance of DC and self-rated DC. A statistically significant relationship was found between the 'self-rated knowledge of electronic tests' and the 'use of electronic tests'. It could be assumed that more SPs who did not consider themselves to be competent in knowing of electronic tests than SPs who considered themselves to be competent did not use electronic tests in practice (APPENDIX 23, SIGNIFICANCE TEST 15).

TABLE 24 *Percentage of respondents at three DC levels using digital resources in 5 work fields of SPs frequently, occasionally, never (ITEM G2Q00004)*

Frequent use	**%Beginner**	**%Competent**	**%Expert**
Administration	12	40	19
Collegial cooperation	12	35	18
Assessment	2	10	5
Treatment/Therapy	7	6	4
Consulting	22	0	47
Σ	55	91	93
Mean	11	18,2	18,6
Occasional use	**%Beginner**	**%Competent**	**%Expert**
Administration	6	10	6
Collegial cooperation	7	17	6,5
Assessment	9	23	10
Treatment/Therapy	35	44	45
Consulting	65	90	51
Σ	122	184	118,5
Mean	24,4	36,8	23,7
No use	**%Beginner**	**%Competent**	**%Expert**
Administration	4	4	0,5%
Collegial cooperation	3	1	0,5
Assessment	11	20	10
Treatment/Therapy	58	50	51
Consulting	13	10	2
Σ	89	85	64
Mean	17,8	17	12,8

These findings should be interpreted with caution due to partially small samples. While most test results suggested no statistically significant relation between DC levels and digital resource use, others did (APPENDIX 23, significance tests 15, 16,17), so that finally no clear relationship could be determined.

Several research papers dealt with factors influencing digital behavior, as BEIER (1999) on control beliefs when using technology, RICHTER & NAUMANN & GROEBEN (2001) on measurement of computer related attitudes, SPANNAGEL & BESCHERER (2009) on computer-related self-efficacy expectations, KARRER, GLASER, CLEMENS & BRUDER (2009) on technology affinity. The "unified theory of acceptance and use of technology (UTAUT)" according to VENTKATESH (2003) is an internationally recognized

technology acceptance theory to examine the users' attitude to accept technology and to adopt new technologies (DE WITTE et al. 2021). Four constructs were identified that had the greatest influence on the intention to use and actual use technology: performance expectancy (Does it add value? VENKATESH 2003, p.447), effort expectancy (How much do I have to invest for a benefit? VENKATESH 2003 p. 450), social influence (VENKATESHJ 2003, p. 451), and facilitating conditions, such as organizational and technical infrastructure (VENKATESH 2003, p. 453). These fundamentals mainly formed the framework for analyzing the motivation of the surveyed SPs to use digital resources.

9.3.4.4. SUMMARY OF THE IMPORTANCE OF DIGITAL COMPETENCE AND DIGITAL USAGE BEHAVIOR

- The **significance of DC represented an important determinant of digital usage in the practice of school psychology.** The relationship between the perceived importance of DC and the use of digital resources in work fields seemed to be valid. It could be assumed that more SPs who considered DC to be important used digital resources in their practice than SPs who considered DC to be unimportant.

- 83% of the respondents in AT, BE, CH, DE assessed DC in general to be important in their professional practice and disposed of an at least average self-rated level of DC. This did not apply to the same extent to single school psychology work fields. Statistically significant differences were found between SPs of AT, BE, CH, and DE regarding both the estimated importance of DC and the use of digital resources. **It can be assumed that the perceived significance of DC importance and the digital usage behavior were influenced by the particular professional context and by culture. In terms of the UTAUT theory, this result indicated that social influence was an important motivation for the use of digital resources in school psychology practice.**

- On average across all 17 school psychology work fields, 76% of respondents used digital resources, 30% frequently, 46% occasionally, and 24% never. On average, at least 40% of the respondents used digital resources professionally in each of 17 school psychological work fields, so **it can be assumed that digital transformation is of concern in all school psychological work fields.**

- **Most frequently DC was important in 'administration/professional development' (90%) and most frequently digital resources were also used in this work field (91%).** 80% of respondents assessed DC as important in prevention, and 83% used digital resources in this area. This was

followed by the area of assessment and evaluation, where 72% considered DC as being important and 70% used digital resources. Among the top 5 work fields in which over 90% of PTPs used digital resources were administration, collegial collaboration, communication with target groups, counseling, and support of pedagogical staff. **The work field of intervention seemed to be most controversial compared to other fields regarding digital transformation:** 57% of respondents were considering DC to be important and 52% were using digital resources. The least respondents used digital resources for health promotion (64%), crisis intervention (57%), learning support (58%) and treatment/therapy (49%).

- The self-rated competence level seemed to be merely relevant for the estimated importance of DC and the usage of digital resources.

- In a country comparison, 84% of Belgian respondents used digital resources in the 17 fields of action, followed by round about three quarters each of German and Swiss respondents (73% and 77%). With 32% Austrian respondents were the largest group of not using digital resources.

9.3.5. ATTITUDE TOWARDS DIGITAL TRANSFORMATION IN SCHOOL PSYCHOLOGY

Since the aspect of value orientation in professional psychological practice was of particular concern in the theoretical discussion of the concept of DC, the connection between DC and the SP's attitude towards digital transformation in their profession was analyzed.

9.3.5.1. EXPERIENCING THE INCREASING USE OF DIGITAL RESOURCES IN SCHOOL PSYCHOLOGY AND DIGITAL USAGE

SP have been asked in the DiCoSP questionnaire about their attitude toward digital transformation by *ITEM G5Q00001: How do you personally experience the increasing use of the internet and digital media in School Psychology?* 58% of respondents felt positive about the increasing use of digital resources in school psychology (Figure 30). At the same time, 42% of the respondents experienced the increasing digitalization as ambivalent or negative. It was assumed that respondents who did not consider DC to be important or did not use digital resources in the school psychology work fields were skeptical about the increase of digital resources in SP.

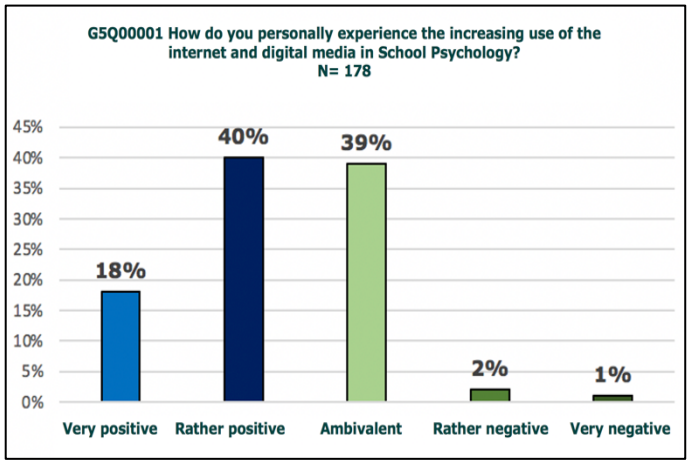


FIGURE 30 *Percentage of response frequency on ITEM G5Q00001: Experience of increasing use of digital resources in School Psychology*

The answers regarding the personal experience of the increasing use of digital resources in school psychology *(ITEM G2Q00001(SQ001)* and the assessment of the DC importance in daily work *(ITEM G5Q00001)* were categorized into **'open-minded' and 'skeptical' attitude towards digital transformation.** Responses that considered DC to be very/rather important in daily practice and experienced the increasing use of digital media in practice as very/rather positive were summarized as "open-minded attitude" *(ITEM G2Q00001(SQ001) A004+A005 and G5Q00001 A001 + A002).* Responses were summarized as "skeptical attitude", which considered DC to be not/ rather not important in daily practice and experienced the use of digital resources as very/rather negative or ambivalent *(ITEM G2Q00001(SQ001) A001+A002+ A003 and G5Q00001 A003 + A004+ A005).* To account for nuances in attitudes towards digital transformation, responses were further categorized into negative attitudes, ambivalent attitudes, and mixed attitudes (open-minded towards increasing use of digital resources, but skeptical about DC importance in school psychology practice; open-minded about importance DC, but skeptical about increasing use of digital resources; each considering ambivalent assessments, Figure 32).

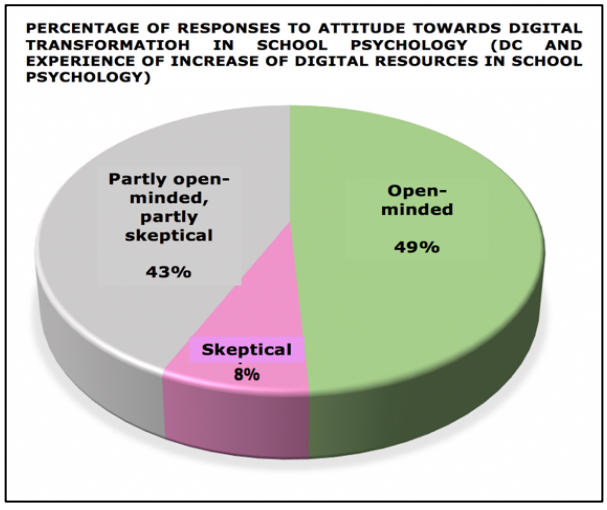


FIGURE 31 *Percentage of respondents' attitudes towards digital transformation (assessment of DC importance and attitude towards increasing use of digital resources in school psychology).*

Figure 31 presented the analysis results of the attitude towards digital transformation (significance of DC/ perception of increase of digital media in school psychology). 49% of the respondents had an open-minded attitude, while 8% were skeptical and 43% were partly skeptical and partly open-minded. None of the respondents had a completely negative attitude

towards both the importance of DC and the increasing use of digital resources in school psychology. 8% of the respondents had a positive attitude towards the increasing use of digital resources but did not think that DC was important or they were unsure about it. **34% of respondents thought DC was important but were skeptical about the increasing use of the Internet and digital media in school psychology.**

Uncertainty seems to be an important characteristic of the attitude towards digital transformation in school psychology practice. While 11% of the respondents showed an ambivalent attitude towards the DC importance in the profession, the ambivalent attitude toward the increase of digital resources was three times higher at 39% (Figure 32). While 4% of respondents were neither certain in their assessment of the DC importance nor in their assessment of the increasing use of digital resources, 42% were either uncertain in their assessment of the DC importance or in their assessment of the increasing use of digital resources. In total, **about half of the respondents (46%)** showed **uncertainty in evaluating the importance of DC and/or the increase in digital resources in professional practice.**

FIGURE 32 *Nominal and percent response frequencies to ITEM G2Q00001 (Significance of DC) and G5Q00001 (Attitude towards increase of digital media) categorized into different attitudes toward assessing the importance DC and increasing use of digital resources in school psychology.*

Questions G2Q00001 and G5Q00001	**Open – Minded Attitude** (Competence 005+004+Increase 002+001)	**Skeptical Attitude** (competence+/- or -/ increase +/- or - A001+A002+A003 and G5Q00001 A003 + A004 +A005)	Undecided and Ambivalent (Competence 003+Increase 003)	Negative as well competence as increase (competence 001+002+increase 005+004)
N	**88**	**14**	**7**	**0**
%	**49%**	**8%**	**4%**	**0**
Competence not important or undecided/ Increase ambivalent (Competence A001+002+003+ Increase 003)	Competence not important or undecided/ Increase + (competence 001+002+003, Increase 002+001)	Competence important + Increase – (competence 005+004+Increase 003)	Competence important +Increase undecided (Competence 005+004+Increase 003)	Competence important/Increase undecided or negative (competence 005 + 004 + Increase 005 +004+003)
13	**15**	**4**	**57**	**61**
7%	**8%**	**2%**	**32%**	**34%**

If nearly half of SPs is not sure about the significance of digital transformation of their profession, this represents a challenge for professional organisations. It is their task to develop a vision of a digital related way of work to reinforce professional competence of SPs and thus the quality of their services. In view of the digital usage behavior it is no question anymore if SPs will implement a digital related way of work in the future. Today's question is how competent are SPs and their work environment in doing so.

9.3.5.2. EXPERIENCING THE INCREASING USE OF DIGITAL RESOURCES IN SCHOOL PSYCHOLOGY AND COUNTRY OF EMPLOYMENT

An interesting question was whether attitudes towards digital transformation differed in the four countries studied (Figure 33), so that a cultural influence could be suspected. The biggest difference in percentages was found in the positive assessment of the increasing use of digital resources in school psychology of 22% between respondents from AT and DE, whereas 41% Austrian respondents were least positive toward the increase. This difference was statistically significant (APPENDIX 23, SIGNIFICANCE TEST 20), so that a cultural influence on the perception of digital transformation must be assumed.

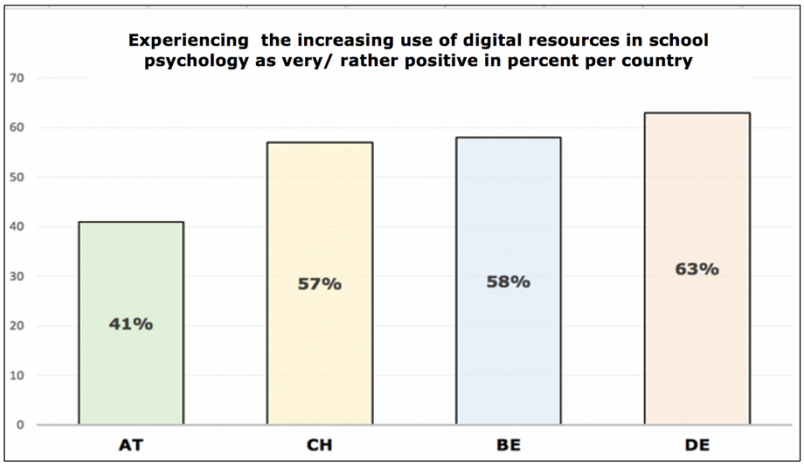


FIGURE 33: *Percentage of response frequency "very positive/rather positive" per country of employment to ITEM G5Q00001 'How do you personally experience the increasing use of digital resources in school psychology? N = 181*

It could be assumed that more SPs in AT than in DE were skeptical about the increase of digital resources in school psychology. This assumption was plausible because regarding digital usage behavior it was found (Chapter 9.3.4.2. USE OF DIGITAL RESOURCES PER COUNTRY OF EMPLOYMENT AND WORK FIELD) that Austrian respondents were most with 32% who never used digital resources in the average of the 17 work fields in school psychology.

No statistically significant relationship could be found between the perception of the increase of digital resources in school psychology and

- the estimated importance of the DC in counseling, which presented with obvious differences among the SP of different countries (APPENDIX 23 SIGNIFICANCE TEST 21);
- the frequency of use of digital resources in work fields (APPENDIX 23 SIGNIFICANCE TEST 19 EXAMPLE OF THE WORK FIELD COUNSELING).

9.3.5.3. EXPECTATIONS ON THE IMPACT OF THE DIGITAL TRANSFORMATION ON SCHOOL PSYCHOLOGY

Expectations regarding DT were analyzed by two questions about what impact DT will have on School Psychology and about the development of digital media in School Psychology practice (TABLE 25 and TABLE 26).

1. The item *G5Q00003 I believe the use of digital media in my work will…*

2. **TABLE 25** *Percentage of response frequency ITEM G5Q00003 I believe the use of digital media in my work will…*

	%
increase	85%
Stay the same	13%
decrease	2%

3. The item *G5Q00004 I think digital transformation will make school psychology ….*

TABLE 26 *Percentage of response frequency ITEM G5Q00004 I think digital transformation will make school psychology…*	**%**
Enrich SP in some /all areas	84%
Hardly change SP/diminish SP in some areas	16%

Both questions were statistically significantly related, so that they were both suitable for analyzing the respondents' attitude toward the impact of DT.

85% of the respondents expected an increasing use of digital media in School Psychology practice, while 15% believed it would stay the same or decrease (TABLE 25). 84% of the PTP believed that digital transformation will enrich School Psychology, and 16% believed that it will hardly change anything or make School Psychology poorer in some areas (TABLE 26). Thus, most respondents attached a positive future expectation to digital transformation in their professional practice in the spirit of HARVEY and CARLSON (2003) *„Psychologists should not replace traditional practice with technological advancements but should consider using these advancements to enhance their practice or to work more efficiently.*" (HARVEY & CARLSON. 2003, p. 104)

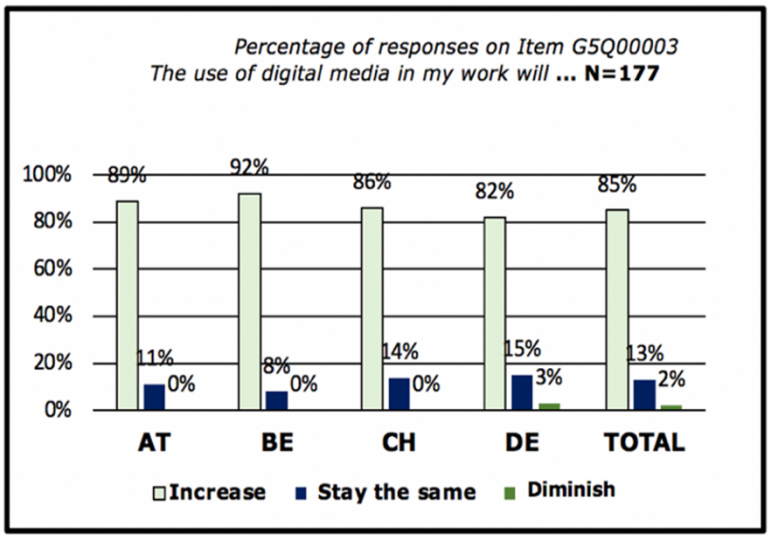


TABLE 27: *Percentage frequency distribution of responses to ITEM G5Q00003 per country.*

While the estimated development of digital resource usage in SP's practice was comparable in the studied countries (TABLE 27), significant differences showed up in the estimated impact of DT on school psychology (TABLE 28).

TABLE 28: *Percentage frequency distribution of responses to ITEM G5Q00004 per country.*

G5Q00004 I believe digital transformation will change school psychology..../ ITEM G2Q00006 Country of employment	**AT N=27**	**BE N=12**	**CH N=37**	**DE N=101**	**Σ=177**
Enrich	**85%**	**92%**	**65%**	**89%**	**84%**
Hardly change/diminish	**7%**	**8%**	**35%**	**11%**	**16%**

At least 85% of the interviewed SPs from AT, BE and DE expected school psychology to be enriched by the digital change. Swiss respondents were at least three times as likely as their colleagues from the other countries to be convinced that DT will hardly change school psychology or that it will make some areas poorer. Accordingly, they rated the digital changes as an enrichment for school psychology to a lesser extent. This difference in expectations between SPs from CH and DE turned out to be statistically significant. It could be assumed that more Swiss than German respondents believed that DT will merely change respectively will impoverish partially school psychology (APPENDIX 23, SIGNIFICANCE TEST 22). This rather pessimistic attitude of the Swiss respondents found its counterpart in the assessment of the DC importance in several school psychology work fields (support teaching staff and parents, psychoeducation, crisis intervention, own training, administration, creation of reports, communication with target groups, collegial cooperation). For example statistically significantly more German than Swiss respondents considered DC as being important in counseling (APPENDIX 23, SIGNIFICANCE TEST 23 and FIGURE 34).

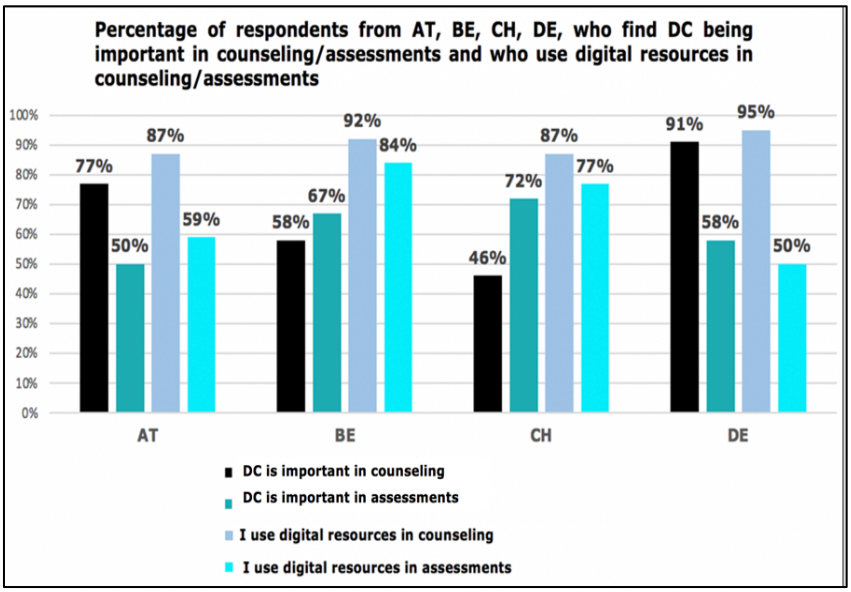


FIGURE 34 *Percentage frequency distribution of responses on the assessment of the DC importance in counseling and assessment and the use of digital resources*

These results indicated that the attitude towards DT was culturally influenced, also being reflected in the assessment of the importance of DC in school psychological practice.

The question also arose as to whether digital usage behavior was linked to expectations of the impact DT on school psychology. It could be assumed that more SP, who considered DT to enrich school psychology, than SP who did expect no changes or an impoverishment of school psychology, used digital resources. Significance tests did not provide a clear answer to this question, as there was a significant correlation in some work fields (e.g. use of digital resources in counselling), while in other fields this was not the case (e.g. use of digital resources in assessments (APPENDIX 23, SIGNIFICANCE TEST 25)/treatment/therapy/administration). As the characteristic 'expected impact of DT on school psychology' had no clear relationship with the use of digital resources, it could only be assumed that the attitude toward DT can be one determinant of digital usage in professional practice (APPENDIX 23, SIGNIFICANCE TEST 24), without being able to specify pre-requisites more precisely.

9.3.5.4. RESULTS ON DIGITAL COMPETENCE IN THE FIELDS OF COUNSELING AND ASSESSMENTS

In view of the professional debate on digitally based assessments and counseling (MACQUEEN 2012; FARMER et al. 2020 a,b; FISCHER et al. 2018 a,b and 2019;FUNKE et.al. 2011; HUNTER et al. 2021; SCHULENBERG et.al. 2004), these two work fields were particularly addressed in this chapter. As Figure 38 showed, there were notable differences in both work fields among the studied countries regarding the rated importance of DC and the use of digital resources. The comparison of both work fields made the different motives behind digital usage behavior more evident.

9.3.5.4.1. RESULTS ON DIGITAL COMPETENCE IN COUNSELING

In the work fields of couseling and assessment there was the highest discrepancy between the frequency of rated DC importance and the use of digital resources. In DE (91%:95%) and AT (77%:87%) the assessment of DC as being important in counseling (*ITEM G2Q00004)* corresponded with high frequency use of digital resources. While 58% of Belgian respondents considered DC as being important in counseling, 92% used digital resources in counseling. 46% of Swiss respondents considered DC as being important in counseling, 87% used digital resources in counseling, a difference of 41%.

This discrepancy could have been a Covid - 19 effect: also SP, having been skeptical towards a digital related work, needed to implement tele – counseling due to school lockdowns and restricted personal contacts. 92% of the DiCoSP respondents named the pandemic to be the driver of remote work in school psychology (TABLE 29). Also the study by REUPERT et al. (2021) stated that SPs in Germany carried out significantly more tele - counselling due to the pandemic than it was previously the case.

TABLE 29 *DRIVERS OF THE DIGITAL TRANSFORMATION*

G4Q00002 Which factors have supported the increase of DT of EPs' workplaces in recent years? N = 181	**Percentage of responses**
Reactive attitude	
Covid -19 Pandemics	92%
Digital work facilitates communication and cooperation (e.g. the professional exchange, training and communication with parents by saving travel time and costs , access to clients)	63%
Recognition that digital media are an important part of of young people's life, so that SP them can reach more easily via digital media	51%
Improved digital infrastructure	43%
It is uncomfortable not to be digitally up to date	23%
Advanced training offers	20%
Supervisors push for remote working	13%
Clients encourage SPs to use digital media	6%
Active, creative attitude	
Digital work is fun and opens new work and design opportunities	30%
Positive examples of remote work were motivating	22%

Several significance tests were applied to find determinants of DC and the use of digital resources in counseling which needed to be considered in the DiCoSP competence framework. In the work field of couseling actions were considered which allowed conversations via digital communication tools (Zoom, Skype, Webex, BigBlueButton etc.), like consultations, collegial case work, online encounters with students and colleagues.

A **statistically significant relation** was found between the

- **assessment of the DC importance in counseling and the country of employment** (APPENDIX 27 SIGNIFICANCE TEST 6 and 8); it could be assumed that more Swiss than Austrian and German SPs did not find DC important in counseling;

- **assessment of the DC importance in counseling and the frequency of use of digital resources in counseling** (APPENDIX 27 SIGNIFICANCE TEST 4 and 26);

- **assessment of the impact of digital transformation on School Psychology and the use of digital resources in counseling and in collegial cooperation** (APPENDIX 23, SIGNIFICANCE TEST 27)

- **assessment of the development of digital transformation on School Psychology and the frequency of use of digital resources in counseling** (APPENDIX 23, SIGNIFICANCE TEST 29)

No statistically significant relationship could be found between

- the **country of employment** and the **frequency of use of digital resources in counseling** (APPENDIX 23 SIGNIFICANCE TEST 30) as well as the **self - rated own DC** (APPENDIX 23 SIGNIFICANCE TEST 9,10,32)

- **the self - rated own DC and the frequency of use of digital resources in counseling, collegial collaboration, assessment (electronic tests)** (APPENDIX 23 SIGNIFICANT TEST 15,16,31)

Based on these results, two major trends could be deducted, which were in so far relevant for the structure of a digital competence framework <y they concerned the necessity to consider attitudes and ethical orientations as foundations of professional digital behavior:

- **attitudes toward digital transformation** (in terms of estimated DC importance, expectation of the development of digital media and the impact of DT on school psychology) **affected digital usage behavior** in counseling. More SP used digital resources, who

  - expected an increase of digital media in school psychology
  - saw DT as an enrichment
  - valued DC,

  than SP, who expected a decrease or no changes in the development of digital media and/or expected no changes or a partial impoverishment of school psychology due to DT and/or did not value DC;

- the **attitude toward DT was subject to cultural influence**. Significantly more Austrian and German than Swiss respondents were ambivalent or negative about the increasing use of digital resources in School Psychology. Significantly more Swiss than German respondents expected no changes respectively a partial impoverishment of School Psychology due to DT;

These relationships were reflected in SP's assessment of remote work with students in comparison to work without digital input, measured by the *ITEM G5Q00002(SQ001) „To what extent do you agree or disagree with the following statement "Online encounters with students are...*

- *just as valuable as offline encounters*
- *a good complement to offline encounters*
- *a stopgap solution.*"

There were five response options "*not agree at all, tend to disagree - undecided - tend to agree - fully agree".* The responses were categorized in open minded and skeptical attitude (FIGURE 40). The responses indicated a rather skeptical attitude toward digital related work with students whereby around three quarter of respondents were open minded toward a hybrid solution with a combination of digital and non-digital work.:

- 81% of the respondents were unsure or did not consider online encounters with students to be as valuable as offline encounters
- 72% of the respondents thought online encounters with students were a good complement to offline encounters.
- 84% of respondents thought online encounters with students were a stopgap solution (Figure 35).

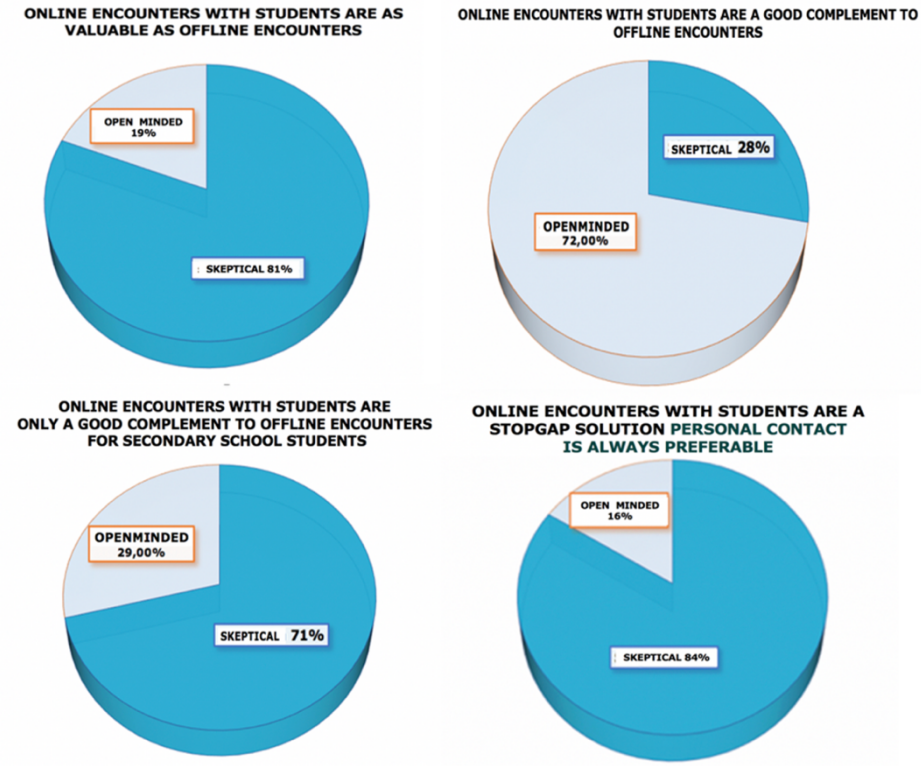


FIGURE 35: *Percentage response frequencies to ITEM G5Q00002 categorized in open-minded and skeptical attitude*

As mentioned in chapter 9.3.5.1. the attitude of the surveyed SPs was characterized by an uncertainty, which significance DT for school psychology has. This uncertainty was reflected in one fifth of the respondents showing uncertainty while assessing a remote way of work with students and colleagues with. Uncertain felt

- 20%, whether an online encounter with students is a stopgap solution,
- 24% whether collegial online workgroups are a stopgap solution,
- 23% whether online collegial workgroups are as valuable as offline work groups
- 18% whether the online encounter with students is a good complement to the offline encounter,

For most respondents, the traditional attitude seemed to prevail that face-to-face encounters are THE reference model of counseling. This attitude was quite common among professional counsellors. REINDL (2009) and WENZEL (2015) pointed to the "myth of immediacy" of face-to-face communication as a possible reason for the reluctance of counseling professionals to engage in online counseling. The myth of "face-to-face counseling being superior to telephone counseling, mail counseling, and chat counseling was seen as a reference standard. and as a "surrogate" for the face-to-face counseling model.

FIGURE 36 *Percentage response frequency for ITEM G5Q00002 – Attitude towards three models of remote – work (N=181)*

G5Q00002(SQ001) To what extent do you agree or disagree with the following statements."? N=181	**G5Q00002 SQ001 *Online encounters with students are just as valuable as offline encounters* (1. Model)**		***G5Q00002 SQ002 Online encounters with students are a good complement to offline encounters.* (2. Model)**		***G5Q00002 SQ004 Online- Online encounters with students are a stopgap solution, personal contact is always preferable* (3. Model)**	
Response		**%**		**%**		**%**
Agreement		19%		72%		64%
G5Q00002 *To what extent do you agree or disagree with the following statements."? N=181*	***G5Q00002 SQ006 Collegial online workgroups are just as valuable as offline workgroups (1.Model)***		***G5Q00002 SQ007 Collegial online workgroups are a good complement to offline workgroups (2. Model)***		***G5Q00002 SQ009 Collegial online workgroups are a stopgap measure, personal contact is always preferable (3.Model)***	
		%		**%**		**%**
Agreement		35%		85%		41%
Σ	**97**	**27%**	**285**	**78,5%**	**191**	**52,5%**

Comparing the three models of remote work with students and colleagues (1. Model of equivalence, 2. Two-track-model with online- and offline work as complementary, 3. Model of presence preference with remote work as stopgap) the two-track model got the highest approval rate among the surveyed SPs (78,5%) (Figure 36). Dissolving the dichotomy of online and face-to-face counseling paves the way for "blended Counseling", for designing a counseling process with different media. This model was attributed central importance for the further development of counseling and therapy. It placed in terms of "customer orientation", the clients, with their different communicative needs, at the center of school psychological work. The high level of approval of the respondents of almost 80% for the two-track model could be seen as a door opener to enriching school psychology practice in the digital age.

The DiCoSP study stated additionally a **statistically significant relationship between the**

- **attitude that online encounters with students are a stopgap solution and the workplace CH/AT compared to BE/DE** (APPENDIX 23 SIGNIFICANCE TEST 33). Although the result had to be interpreted with caution due to the small sample, it could be assumed that more SPs in AT and CH considered online encounters with students as a stopgap solution than SPs in BE and DE. The result was consistent with the finding that significantly more Swiss than German respondents were skeptical about the impact of digital transformation on school psychology and that significantly more Austrian than German respondents were skeptical about the increasing use of

digital resources in school psychology. Again, a cultural influence on the attitude towards remote work was confirmed.

- **attitude that online encounters with students are a stopgap solution and the use of digital resources in counseling.** It could be assumed that more SPs who considered remote work with students to be a stopgap, used fewer digital resources in counseling tended to use digital resources in counseling than SP who were open minded toward remote work with students. This result supported the hypothesis of a relationship between attitudes toward DT and digital usage behavior (APPENDIX 23 SIGNIFICANCE TEST 34).

- the **key competence 'creativity in remote work**' and **'online encounters with students as a stopgap solution'**. Via ITEM G4Q00002SQ004 the DiCoSP respondents were asked if enjoying remote work as an opener for new ways of working and designing has been a driver of DT in their professional practice (TABLE 29). The relationship between 'creativity' and 'attitude towards online encounters with students being a stopgap 'solution turned out to be statistically significant. It could be assumed that more SPs who did not enjoy remote work qualified digital encounters with students as a stopgap than SPs who enjoyed designing remote work (APPENDIX 23 SIGNIFICANCE TEST 34); The key competence of creativity emerged as a driver for remote work in school psychology practice.

In summary, these results indicated that attitudes towards remote work with students and colleagues were culturally influenced and had an impact on the use of digital resources. Also transversal key competences seemed to be subject to cultural influence. Open-mindedness towards DT seemed to be a facilitator for remote work in school psychological practice. This relationship justified the inclusion of attitudes, values, and transversal key competences in a digital competence framework.

9.3.5.4.2. RESULTS ON DIGITAL COMPETENCE IN ASSESSMENTS

In contrast to the work field of 'counseling', the estimated importance of DC and the use of digital resources was different in the work field of 'assessments'.

While in the work field of 'counseling' 77% considered DC to be important and 92% used digital resources, in the work field of 'assessments' there was a balanced ratio as in almost all the other 15 work fields: 61% of those surveyed considered DC to be important and 59% used digital resources (FIGURE 38). 68% of the respondents found it important to know electronic test procedures for students and to be able to critically assess their psychometric qualities (ITEM G2Q00003 SQ017; PK specialist knowledge according to DiCoSP matrix), while 48% felt competent in this. As in almost all areas of

school psychology, a **statistically significant relationship was found in the work field of 'assessments' between the estimated importance of DC and the use of digital resources in assessment in professional practice**. It could be assumed that the appreciation of DC leads to increased use of digital resources in assessments (APPENDIX 23 SIGNIFICANCE TEST 3 and 38).

Round about half of the PTP from AT and DE estimated DC to be important in assessments, while more than two third of respondents from BE and CH considered DC to be important (TABLE 30).

***ITEM G2Q00003SQ017* Importance of DC and *ITEM G2Q00004 SQ012* use of digital resources in the work field 'assessments' = 189**	**AT**	**BE**	**CH**	**DE**
Percentage of responses finding DC important in assessments	50%	67%	72%	58%
Percentage of responses using digital resources frequently/occasionally in the work field 'assessments'	59%	84%	23%	50%

TABLE 30: *Percentage of responses finding DC important and using digital resources in the work field 'assessments'*

No statistically significant differences among the studied four countries could be found (APPENDIX 23 SIGNIFICANCE TEST 7). It could be assumed that the estimated DC importance in the work field of assessments was equally distributed among SP in AT, BE, CH, and DE, while differences in the estimated DC importance among the countries were statistically significant in the work field of counseling. **While there were no country-specific differences in the estimated importance of DK in the field of diagnostics, these were statistically significant in the field of counseling,** in which significantly more Swiss than German respondents did not consider DC to be important (APPENDIX 23 SIGNIFICANCE TEST 6).

Whereas in most work fields a positive attitude of the SP towards digital transformation led to the application of digital resources (APPENDIX 23 SIGNIFICANCE TEST 24,27,29,34), this relationship did not apply to digital test assessments (APPENDIX 23 SIGNIFICANCE TEST 25,41).

TABLE 31 FREQUENCY DISTRIBUTION OF USE OF DIGITAL RESOURCES AS A FUNCTION OF ASSESSMENT OF THE IMPACT OF DIGITAL TRANSFORMATION ON SCHOOL PSYCHOLOGY				
G5Q00004 I believe digital transformation will transform school psychology.... // G2Q00004 How often do you use digital resources in the...?	**FREQUENT USE OF DIGITAL RESOURCES IN ...**	**OCCASIONAL USE OF DIGITAL RESOURCES IN....**	**SUM FREQUENT AND OCCASIONAL LY USE OF DIGITAL RESOURCES IN...**	**NO USE OF DIGITAL RESOURCES**
G2Q00004SQ016 COLLEGIAL COOPERATION N=184	**KZSA**	**KZSA**	**KZSA**	**KZSA**
Stagnation/decrease of school psychology.	7%	7%	14%	2%
Enrichment of school psychology	**58%**	23%	81%	3%
G2Q00004 SQ012	**ASSESSMENT**	**ASSESSMENT**	**ASSESSMENT**	**ASSESSMENT**

ASSESSMENT N=185				
Stagnation/decrease of school psychology	4%	4%	8%	8%
Enrichment of school psychology	13%	37%	**50%**	**34%**
G2Q00001SQ00001 COUNSELING N=185	**COUNSELING**	**COUNSELING**	**COUNSELING**	**COUNSELING**
Stagnation/decrease of school psychology of school psychology.	2%	10%	12%	4%
Enrichment of school psychology	32%	48%	80%	4%
G2Q00004SQ00011 TREATMENT/THERAPY N=185	**TREATMENT/ THERAPY**	**TREATMENT/THERAPY**	**TREATMENT/THERAPY**	**TREATMENT/THERAPY**
Stagnation/decrease of school psychology	3%	9%	12%	4%
Enrichment of school psychology	5%	44%	**49%**	**35%**
G2Q00004SQ00003 HEALTH PROMOTION N=185	**HEALTH PROMOTION**	**HEALTH PROMOTION**	**HEALTH PROMOTION**	**HEALTH PROMOTION**
Stagnation/decrease of school psychology	0%	8%	8%	8%
Enrichment of school psychology	10%	43%	**53%**	**31%**
G2Q00004SQ000 OWN TRAINING N=185	**OWN TRAINING**	**OWN TRAINING**	**OWN TRAINING**	**OWN TRAINING**
Stagnation/decrease of school psychology	5%	9%	14%	2%
Enrichment of school psychology	**43%**	**37%**	80%	4%
G2Q00004SQ0000 COMMUNICATION WITH TARGET GROUPS N=185	**COMMUNICATION WITH TARGET GROUPS**	**COMMUNICATION WITH TARGET GROUPS**	**COMMUNICATION WITH TARGET GROUPS**	**COMMUNICATION WITH TARGET GROUPS**
Stagnation/decrease of school psychology	6%	6%	12%	3%
Enrichment of school psychology	**50%**	31%	81%	3%

34% of respondents who perceived DT as an enrichment did not apply digital resources in assessments, while in most other work fields this percentage was below 12% - except for treatment/therapy, health promotion, and crisis intervention (TABLE 31). Though significantly more Swiss than German SPs thought that DT will merely change anything in school psychology or will diminish certain areas, they used significantly more digital resources in assessments than German respondents (APPENDIX 23 SIGNIFICANCE TEST 22).

While in the work field of **'counseling'** a statistically significant relationship was stated between the **attitude towards DT in school psychology and the frequency of using digital resources** (APPENDIX 23 SIGNIFICANCE TEST 24,27,29,34), **this was not the case in the work field of 'assessments'** (APPENDIX 23 SIGNIFICANCE TEST 25,41,44).

The use of digital resources in 'assessments' and

- the expected impact of DT on school psychology (APPENDIX 23 SIGNIFICANCE TEST 25),

- the expected development of digital media in school psychology (APPENDIX 23 SIGNIFICANCE TEST 44),
- the perception of increasing input of digital media in school psychology (APPENDIX 23 SIGNIFICANCE TEST 39).

These findings suggested that attitudes towards DT in the work field of 'assessments' did not seem to play a relevant role for the use of digital resources compared to the work field of 'counseling'.

In contrast, a **significant relationship** was found between the **country of work and the use of digital resources in assessments** (APPENDIX 23 SIGNIFICANCE TEST 14 and 40), whereby it could be assumed that more Swiss than German and Austrian respondents used digital resources in assessments. Such a relationship was not found in the work field of counseling.

The question arose as to what conditions existed so that Swiss SPs apparently worked more digitally in assessments. Switzerland, which was best equipped digitally in an international comparison (IMD World Digital Competitiveness (WDC) Ranking), also performed best in the DICOSP results in terms of school psychology service equipment with subject-specific software and in terms of use of virtual tests. TABLE 32 summarized some key points of the conditions in the comparison of the four countries:

TABLE 32 *Conditions of remote work in AT, BE, CH, DE*

Conditions of remote work in Professional Competence in the work field 'assessments'	ITEM G2Q00003 SQ017 Knowledge of digital tests % very/ rather competent N=128	ITEM G2Q00003SQ017 Percentage of SP estimating Importance of DC (knowing electronic tests) N=190	ITEM G2Q00004 SQ012 Importance of DC in the work field 'assessments' N = 138	ITEM G6Q00003 Use of electronic tests N=183	ITEM G2Q00004 SQ012 Use of digital resources in 'assessments' N=190	ITEM G6Q00002 SQ004 Good infrastructure with specific software, as licenses for electronic tests N=174
AT	56%	47%	67%	19%	59%	23%
BE	25%	83%	50%	25%	84%	0%
CH	46%	72%	72%	57%	75%	54%
DE	48%	58%	58%	20%	50%	32%

In CH, the equipment with specific digital software appeared to be the best in comparison of the four countries (TABLE 38). Half of the Swiss respondents (54%) worked at workplaces with well/ very well equipment with specific software. They also used electronic tests in assessments (57%) most frequently, with about half of the Swiss respondents (46%) feeling competent to do so. About three-quarters (72%) of Swiss respondents considered DC in the work field of assessments as being

important and used digital resources in the work field of assessments (75%).

Respondents from **BE** did not feel equipped with specific digital software. Nevertheless, electronic tests were used by a quarter of Belgian respondents (25%) who also felt competent to do so (25%). 83% of Belgian respondents considered DC as being important and used digital resources in the work field of assessments (84%).

In **DE,** equipment with specific digital software appeared to be low (32%) and minimally used. 80% never used electronic tests, with almost half of respondents (48%) feeling competent to know electronic tests. Although 58% considered DC to be important 50% used digital resources in the work field of assessments.

In **AT**, the equipment with specific digital software seemed to be the lowest of all four countries (23%). Austrian respondents also scored lowest in using electronic tests (19%), with over half of the Austrian respondents (56%) feeling competent to know electronic tests. 41% never used digital resources and 67% considered DC to be important in the work field of assessment.

These findings are supported by the results of the "School Barometer" study (2020) by the Institute for Educational Management and Economics (IBB) at the University of Teacher Education Zug/CH on the impact of the Covid-19 pandemic on schools in CH, DE, and AT (HUBER u. a. 2020).

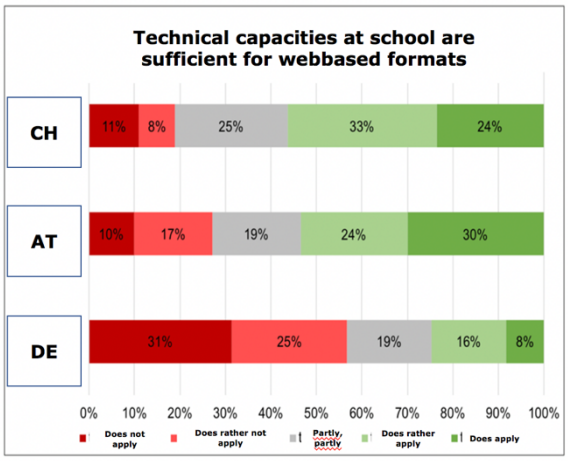


FIGURE 37 *Digital capacities of schools for web based formats in teaching and learning (adapted from source: HUBER u. a. 2020, pp. 97/98)*

As figure 37 showed Germany and the two Alpine countries differed significantly in terms of digital resources, technical capacities, and digital learning possibilities. According to respondents, there were significantly more resources and technical capacities available for digital learning and teaching in CH than in DE and AT (Figure 37 AND APPENDIX 22 CONDITIONS OF REMOTE WORK). In CH 19%, in AT 27% and in DE 56% of the surveyed

teachers stated that technical capacities of their school were not suitable for the application of web-based learning and teaching formats.

A comparison of the DiCoSP questionnaire results for German and Swiss SP led to the following characteristics:

- The assessment of DC importance was equally distributed among Swiss and German respondents (APPENDIX 23 SIGNIFICANCE TEST 7);
- Knowledge of electronic testing was equally distributed among SPs of both countries (TABLE 32)***;***
- Statistically significant, more Swiss than German respondents used digital resources in assessments and tests (APPENDIX 23 SIGNIFICANCE TEST 14 AND 40);

Additionally a statistically significant relationship was stated between the use of electronic tests and

- the self - rated knowledge of electronic tests (APPENDIX 23 SIGNIFICANCE TEST 15)
- the availability of specific software (APPENDIX 23 SIGNIFICANCE TEST 43); more Swiss than German respondents had better equipment with subject-specific software than German respondents (TABLE 32).

Like in the work field of 'Counseling' the relevance of key competence was also stated in the work field of 'Assessments'. A **statistically significant relationship** was found between the **"Knowledge of electronic tests" and the key competence of "Technic affinity"** (APPENDIX 23 SIGNIFICANCE TEST 42).

Based on these findings, it could be concluded that the **knowledge and use of digital resources in diagnostics was closely related to the digital equipment of school psychology services.**

Electronic tests are relatively cost-intensive, so it was very likely that the different budgetary resources of school psychology services influence the purchase of these resources and thus also the remote work in the work field of 'assessments'. 'Assessments' was one of the work fields in which, most respondents (41%) did not use digital resources (Chapter 9.3.4.1.). An example comment from the DiCoSP questionnaire supported this assumption: "I see a challenge in the use of digital resources the unwillingness of the authority to allocate budget funds for the purchase of software that is suitable in terms of content and subject matter (e.g. a suitable video conference system for implementation of digital training)."

These requirements made it necessary that the infrastructure of SP's workplace was also considered in a digital competence framework.

9.3.5.4.3. SUMMARY OF RESULTS ON DIGITAL COMPETENCE IN COUNSELING AND ASSESSMENTS

In both work fields the use of digital resources is related to the attribution of DC importance (importance of DC in counseling and in assessments, importance of knowledge of electronic tests). In counseling, the value orientation and attitude towards digital transformation (expected impact on school psychology, expected development of the use of digital resources, estimated relevance of remote versus traditional ways of working with students) was an important determinant of digital use. Attitudes seemed to be culturally influenced. Face-to-face counseling was considered as the reference model by most SPs. Comparing models of remote work there was most support for the dual-track model (47%) with complementary offline and online work. This could be seen as a door opener to an enrichment of school psychology. Overcoming the dichotomy between online and face-to-face counseling leads to "blended counseling," which is of central importance for the future development of counseling and therapy. Applying different media in counseling respects different communicative needs of clients and improves the key competence "client orientation" in school psychological practice.

Around one fifth of the respondents were unsure how to assess remote work in 'counseling'. The aspect of added value (Does digital counseling bring more professional benefits than face-to-face counseling?) seemed to be more relevant in the field of 'counseling' than in 'assessments'.

In the work field of 'assessments', the availability of digital resources was an important determinant of digital use. This finding was supported by the UTAUT theory, which considered facilitating conditions to be one of the four main determinants to use technology. The key competence of creativity appeared to play a role in the attitude towards remote work with students. These results supported the necessity to consider in the DiCoSP digital framework attitudes, value orientation, culture, and key competences as part of DC as well as infrastructure of SP's workplaces.

9.3.5.5. INFLUENCE OF SAMPLE CHARACTERISTICS ON ATTITUDE TOWARD DIGITAL TRANSFORMATION

The question of influencing factors on SP's attitude towards DT led to the evaluation of various sample characteristics. The following characteristics were considered as independent variables:

- Work experience
- Country
- Urban/Rural area
- Gender
- Age
- Seniority
- Professional position
- Workplace
- Team size
- Full-time/ Part-time
- Infrastructure at the workplace
- Competence.

No statistically significant relationship was found between the SP's **attitude towards DT** in form of estimated importance of DC (ITEM G2Q00001(SQ001) and perception of increased input of digital media in school psychology (ITEM G5Q0000)

- Gender
- Age
- Seniority
- Part/full time
- Management function (no management/leadership/position in supervisory authority)
- Urban/Rural environment
- Place of work (primary/secondary; place of work school - place of work central school psychological service outside school).

A relevant statistically significant relationship was found between the SP's perception of increasing input of digital media in school psychology and the **country of employment** (APPENDIX 23 SIGNIFIKANCE TEST 20). More SP in AT and in CH than in DE seemed to be ambivalent or negative about DT in school psychology. No statistically significant differences could be stated between SP in AT, BE, CH, DE regarding the estimated general importance of DC in professional practice (APPENDIX 23 SIGNIFIKANCE TEST 5). Detailed information on the evaluation of sample characteristics can be found in APPENDIX 23, 46 ”Detailed results on the attitude toward increased input of digital media in school psychology and estimated importance of DC in school psychology”.

9.3.5.6. EXCURSUS: SALUTOGENESIS MODEL AND COMPETENCE IN SCHOOL PSYCHOLOGY PRACTICE

A digital competence framework of school psychology practice includes the aspect of health at work (digital related self-competence according to the DiCoSP Matrix). Based on the salutogenesis model according to ANTONOVSKY (1997), a strongly developed sense of coherence means that a person can respond to requirements in a way that is conducive to health, using the resources available to them. The sense of coherence consists of three components: the feeling of comprehensibility, manageability, and meaningfulness. The feeling of comprehensibility refers to a cognitive processing pattern that describes the ability to process unknown information as orderly and structured. The feeling of manageability expresses a person's conviction that problematic issues are classified as solvable. The feeling of meaningfulness represents the most important component. Since without the experience of meaningfulness and a positive basic attitude towards life, the other components are invalid. Individuals who perceive their lives as emotionally meaningful are willing to accept demands as challenges and expend energy on them (BENGEL&LYSSENLKO 2012, p.16). Accordingly, healthy coping with the challenges of DT requires a sense of coherence, which could be assessed in the DICOSP study using several questions (APPENDIX 23,47 ITEMS TO

EVALUATE SP'S RESILIENCE TO COPE WITH DIGITALL TRANSFORMATION IN THEIR PROFESSION).

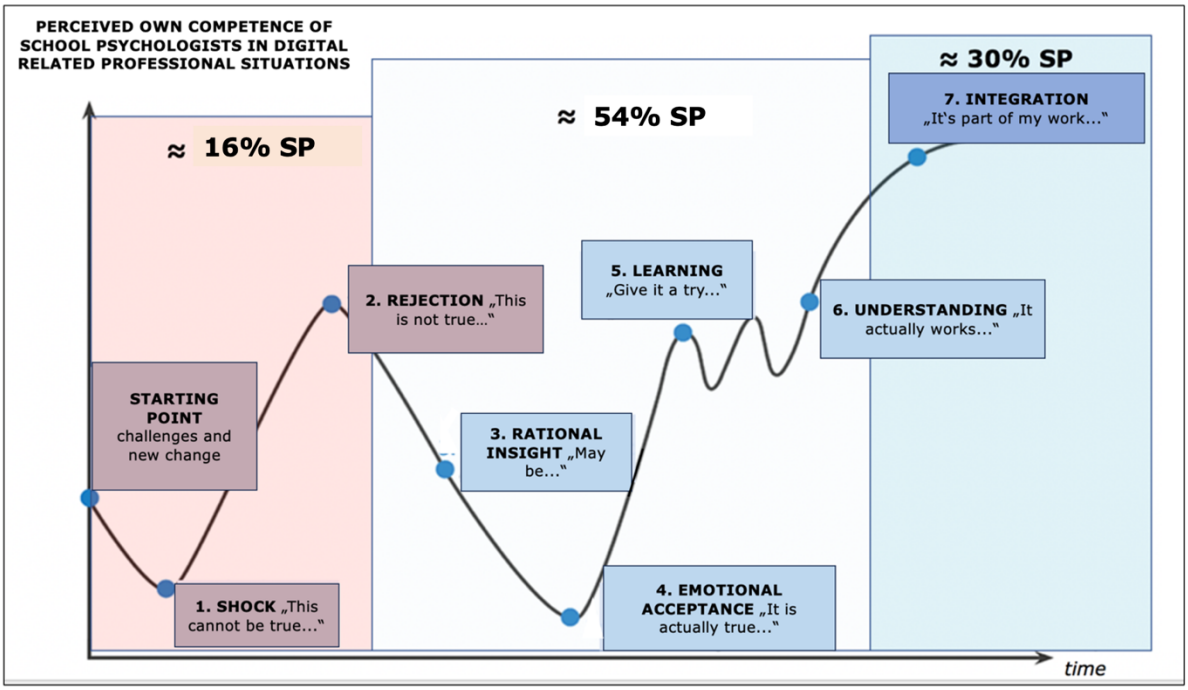
It can be concluded that most respondents had a sense of coherence regarding DT in school psychology practice, with respondents being the least likely to understand the impact of digital transformation on school psychology practice at 67% (*ITEM G2Q00003 SQ023*), slightly more at 72% seeing a purpose in digital transformation (*ITEM G5Q00004*) and at 82% seeing digital transformation as manageable *(ITEM G200005 SQ005, G200005 SQ010, G200005 SQ002, G200005 SQ001).* For almost all respondents, paying attention to their own digital well-being was important (96%) and 87% felt competent to do so (Self-competence in the DiCoSP competence framework). This represented good conditions for SPs to be able to cope with DT in school psychology in a healthy manner.

Only a small percentage of respondents were skeptical regarding the meaningfulness and manageability of DT:

- 16% of respondents thought that DT will have no impact or a negative impact on SP (*ITEM* G5Q00004) and
- 3% of respondents saw no added value in using digital resources *(ITEM G4Q00001).*
- 7% of respondents felt they could not handle changes due to digital transformation (*ITEM* G4Q00001SQ009), because they felt overwhelmed by VUCA characteristics, such as complexity and rapid change.

While salutogenesis as a bio-psycho-social concept represents a comprehensive health background, the concept of resilience is primarily related to psychological development, such as stress management. Both concepts are closely related. Resilience at work represents the ability to deal with changes and adverse circumstances in a self-regulating manner in such a way that the ability to act is maintained. STREICH (HOFMANN & LINNEWEH & STREICH 2006) described the processing of such changes in his 7-phase model (Figure 38). The results of the DiCoSP questionnaire were related to this model (DETAILS OF THE ANALYSIS OF THE STREICH MODEL CAN BE FOUND IN APPENDIX 23, 48 DATA ASSIGNING THE QUESTIONNAIRE RESULTS TO THE STRAIN 7-PHASE MODEL).

FIGURE 38: *Model of processing digital transformation in school psychology practice according to the model of R. STREICH (1997).*



The high appreciation of DC by 83% of respondents, the at least average DC of 77% according to their own assessment, the use of digital resources by 76% of respondents, the majority of respondents' positive attitude towards DT and self-efficacy beliefs represented a good prerequisite for the majority of SP to cope with DT resiliently in her job. According to the STREICH model, around 16% of those surveyed were in phases 1 and 2 of DT (shock phase, defense, and rejection). Approximately 54% could be assigned to phases 3 to 5, which were primarily about trying things out and increasingly collecting and developing new information as well as emotional acceptance.

Contributions from the expert focus groups illustrated this phase:

"...my attitude to it is the idea that maybe you just have to travel along to see where the journey takes you in the end and really try it out and have a certain tolerance for mistakes or admit it to yourself in order to know where it's going and what you can learn then."

"I think we can demand for encouragement and supervision or similar as a safety belt in order to be able to use digital spaces and to learn what we can do better so that no one struggles with an experiment...."

Around 30% of DiCoSP respondents were in the last phases 6 and 7, in which remote work was an integral part of professional practice.

Some empirical results suggested cognitive dissonances of the respondents, which were typical for the phases 3-5:

- 42% of respondents were skeptical about the increasing use of digital resources in school psychology (*Question G5Q00001 What is your personal experience of the increasing use of the Internet and digital media in school psychology?),* but 76% of respondents use digital resources on the job;
- 34% of respondents valued DC but were unsure or opposed to using digital resources in their professional practice;
- In nearly all assessment questions DC was rated more often as important than the respondents' rated their own DC. For example between 70% and 84% of the respondents found it important

  - to know of professional and legal standards according to remote work to be able to ensure the quality of their own services, 38% felt competent about it.

  - to be able to help schools prevent cyberbullying, 44% felt competent to do so.

Obviously, there is a considerable gap between aspiration and implementation of remote work in important areas of SP's practice, so that the **digital-related professional and methodological competence must be questioned** (chapter 9.3.6.). It could be assumed that some dissonances were related to the feeling of uncertainty of 46% of the respondents about the significance of digital transformation in their professional practice *(ITEM G2Q00001 and G5Q00001).* These discrepancies in estimating the importance and self- rated competence in the knowledge and skills base of DC raised ethical and practical professional questions. How can high quality services be guaranteed in the future if School Psychology continues to transform digitally, especially with the experience of the Covid-19-Pandemics, but merely half of SP are skeptical about the input of digital resources. The discrepancies **indicated the need for professional support of SPs in practice to guarantee quality of services, e.g. in form** of developing guidelines with a vision for school psychology's attitude toward digital transformation shaping school psychology's digital identity.

Since the cultural aspect seems to play a role in evaluating DT and in the professional usage of digital resources, it would be useful to first develop such a vision and guidelines in a national framework.

9.3.5.7. SUMMARY OF THE ATTITUDE TOWARD DIGITAL TRANSFORMATION IN SCHOOL PSYCHOLOGY

The majority of surveyed SP showed a positive expectation towards DT of school psychology practice and was confident to be able master the digital challenges in their profession (83% valuating the importance of DC, 77% with at least average self – rated DC, 76% using digital resources professionally, 84% considering DT to be an enrichment for school psychology, 88% being convicted of their self - efficacy in remote work). According to the salutogenesis and resilience concept, most respondents seemed to have good prerequisites for being able to cope with DT in their job in a healthy and resilient manner.

However, around 46% of respondents expressed a certain degree of uncertainty as to how DT should be assessed in school psychology practice. 42% of respondents were skeptical about the increasing use of digital resources in school psychology. According to the STREICH model, the inconsistency between a positive attitude and uncertainty of nearly half of the respondents could be interpreted as a typical sign of phase 4. It is about the emotional engagement with DT in professional practice. being accompanied by a series of cognitive dissonances.

The empirical results showed that **DC is a necessary condition for the use of digital resources, but not a sufficient condition**. No statistically significant relationship could be found between the subjective assessment of the DC level and the frequency of digital use or the assessment of the importance of DK in professional practice.

On the other hand, a statistically significant relationship was found between the assessment of the importance of DC and the frequency of use of digital resources, as well as between

o the expectations regarding the impact of DT as an enrichment of school psychology and the frequency of use of digital resources,
o the country of employment and the use of digital resources as well as the attitude towards DT
o the digital infrastructure and DC as well as the digital usage behavior.

It was assumed that the attitude towards DT was a determinant of digital usage behavior and that it was subject to cultural influences. Based on the empirical results, a digital competence framework should consider school psychological work fields and cultural requirements, since the attitude towards DT and the use of digital resources was statistically significantly associated with the country of employment and the work field. While more Austrian than German SPs seemed to be more skeptical about the increasing use of digital media in their profession, more Swiss than German SPs seemed to be more skeptical about a positive impact of

digital transformation on school psychology. Consistent with this assumption was the finding that Austrian respondents constituted the largest group with 32% not using digital resources in 17 school psychology work fields.

In the work field of counseling, the attitude towards DT was an important determinant of digital usage and appeared to be culturally influenced. Face-to-face counseling was considered as the reference model in their practice by most SPs, so that 85% of the respondents considered remote work with students to be a stopgap solution. Among three models of remote work there was a preference of the respondents for the dual-track model with a combination of offline and online work (47%). This attitude could be seen as a door opener for "Blended Counseling", being considered of having a central role for the further development of counseling and therapy.

In the work field of 'assessments', a statistically significant relationship was found between the use of digital resources in test diagnostics and knowledge of electronic tests as well as equipment of the workplace with subject-specific software. The Swiss SPs seemed to have better digital equipment compared to their colleagues from AT, BE and DE and, statistically significantly more Swiss than German respondents used digital resources in test procedures, although significantly more Swiss than German respondents expected no changes or impoverishment of school psychology by DT.

In addition to the influencing factor of attitude towards DT, culture and digital infrastructure, key competences (e.g. creativity and affinity for technology) also proved to be an important influencing factor of DC and digital usage behavior in school psychology practice. More technology-savvy respondents than non-technology-savvy respondents seemed to know about electronic tests. More SPs thought that remote work with students was a stopgap solution. who did not appreciate to have new possibilities by remote work than SPs who appreciated creatively remote work.

The following sample characteristics did not appear to have a decisive influence on the SP's attitude toward DT:

- Gender
- Age
- Seniority
- Part/full time
- Management function (no management/leadership/position in supervisory authority)
- Urban/rural environment
- Work location (primary vs. secondary; school vs. out-of-school school psychology service work location).

These results dispelled several common prejudices. The attitude towards DT did not differ significantly among

- younger and senior SPs
- female and male SPs
- SPs working in direct contact with pupils in schools and SPs working in services outside schools.
- SPs working in rural from SPs working in urban regions.

9.3.6. DIGITAL COMPETENCE OF SCHOOL PSYCHOLOGISTS AND THE DICOSP DIGITAL COMPETENCE FRAMEWORK

To assess whether the developed digital competence framework meets the needs of the SP in practice, the following assessment questions (importance, competence) were included in the evaluation, namely:

24 Questions on digital-related skills*, e.g. I can organize, store, retrieve and send reports digitally*
17 Questions on school psychological fields of action, e.g. *I am digitally competent in diagnostics*
13 questions on key competences, e.g*. I can prioritize well when dealing with a flood of emails*
4 Questions on attitudes towards DT, e.g. *How do you experience the increasing use of the Internet and digital media in school psychology?*
3 Questions about one's own DC assessment, e.g. *I like to help my colleagues to solve problems.*
digital problems (mentor)

Detailed data can be found in APPENDIX 23,49.

9.3.6.1. RESULTS ON THE BASICS OF COMPETENCE CLASSES

Questions of the *ITEMs G2Q00003, G200005, G2Q0006* were sorted by competence classes and KAS as well as by importance and DC's own assessment to be able to analyze which areas of the DiCoSP digital competence framework are relevant for SP in practice and in which areas they feel competent or not competent.

9.3.6.1.1. DIGITALLY - RELATED PROFESSIONAL, METHODOLOGICAL, SOCIAL AND PERSONAL - COMPETENCE

TABLE 33 showed the results of estimated importance of the fundamentals of PMSP /KAS of DC and of the according estimated own competence of SP's.

TABLE 33 *Percentage frequency of responses on assessments of the PMSP basics as important and not being competent (ITEM G2Q00003, G200005, G2Q0006)*

ITEM Digitally related competence classes in school psychology practice DC N=181	%= DC is Important (very/rather important)	%= i am not Competent (rather not/not at all competent)	% Difference
Digital related professional competence			
Knowledge	79%	49%	30%
Skills	76%	54%	22%
Attitude	86%	76%	10%
Mean PC	**80%**	**60%**	**20%**
Digital related methodological competence			
Knowledge	82%	49%	33%
Skills	63%	49%	16%
Attitude	74%	68%	6%
Mean MC	**73%**	**55%**	**18%**
Digital related social competence			
Knowledge	71%	28%	43%
Skills	82%	71%	11%
Attitude	77%	56%	21%
Mean SC	**77%**	**52%**	**25%**
digitale related personal competence			
Knowledge Skills/	89%	79%	10%
Attitude	92%	88%	4%
Mean PEC	**90%**	**83%**	**7%**
Mean Total	**80%**	**62%**	**18%**

73% of the respondents considered the DC classes to be important, with **digital related professional competence** and **personal competence** being the most frequently considered as important (80%). Almost all the DC foundations were important by at least 71% of the respondents. Only "digital methodological competence skills" were important by fewer respondents (63%). Comparing the KAS - typology, on average **77%** of the respondents considered the category '**knowledge and skills'** and **82% 'attitudes' to be important.**

Based on these results, it can be concluded that most respondents considered the basic structure of the DiCoSP digital competence framework to be relevant in school psychology practice.

The assessment of SP's own DC showed more differences (Figure 39). Most often, respondents considered themselves as being competent in the basics of digital **personal competence, at 83%,** while around half of the respondents considered themselves to be competent in the other

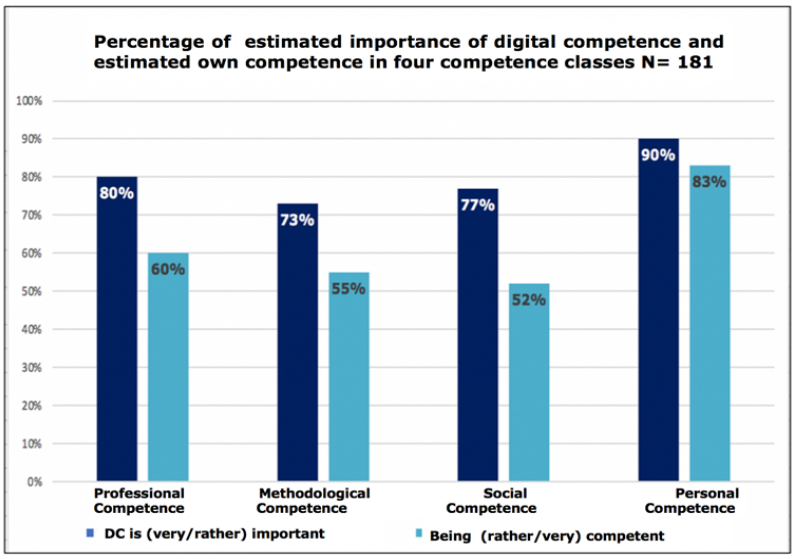


FIGURE 39: *Percentage of responses on importance of DC and own DC in four competence classes*

three competence classes. Comparing the KAS - typology, on average **63%** of respondents felt competent in the **basic skills** and **72%** in the **attitudes** of the four competence classes PMSP, while on average about **42%** felt competent in the **knowledge** bases PMS.

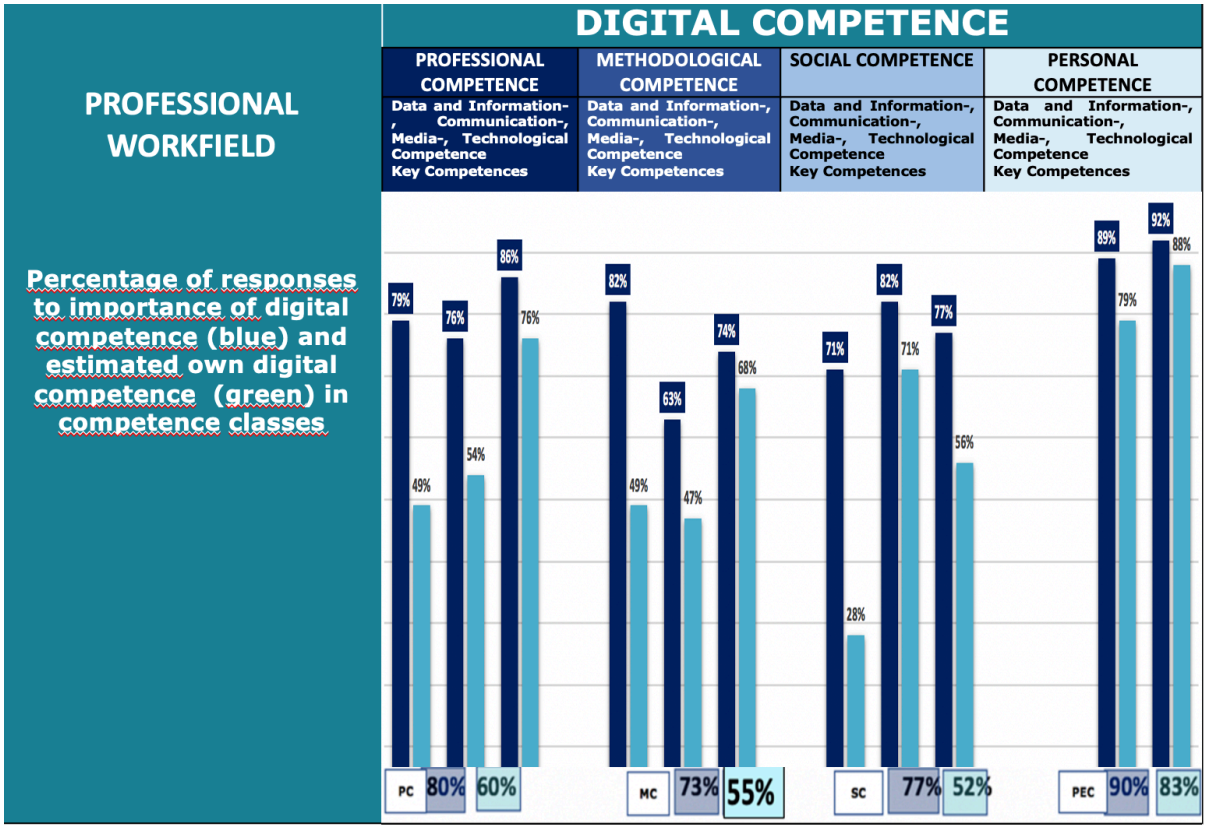
Most participants felt competent in the foundations of attitudes and skills of digital personal competence, which primarily concerned key competences, such as "*I am confident that I can use digital resources effectively in my job." or "I can organize myself well in the face of increasing flexibility in work hours and jobs."*

The **fewest PTPs felt competent in the knowledge base of the competence classes PMS** (42% on average) and in **skills of methodological competence (49%)**, which concerned DC, such as "*I know technical solutions to protect confidentiality in digital consulting." or "I know professional and legal standards to ensure the quality of my digital services." Or "I know about digital copyrights and licenses."*

Comparing the distribution of responses on the assessment of DC importance and one's own competence, the largest discrepancy was found in digitally related social competence with a 25% deviation. In none of the competence classes there was an equal percentage of responses feeling competent and estimating the DC as important.

The DiCoSP digital competence framework visualized how often respondents rated DC in the four competence classes categorized by KAS as being important and their own DC (Figure 40).

FIGURE 40: *DiCoSP DC framework with percentage frequency responses on the assessment of DC importance and assessed own DC.*



Based on this frequency distribution, it can be concluded that the quality of SP remote services could be improved by a consolidated knowledge base of DC. A question mark arose for further skills acquisition in digital methodological competence. Round about half of the respondents felt competent in this area, though 63% considered DC to be important. However, professional - methodological competence is required in digital-related school psychology work to be able to handle digital hardware and software, transfer or store data in a protected manner and ensure the anonymity of the recipients (Deutsche Gesellschaft für Onlineberatung (DGOB) 2018). Therefore, methodological competence was discussed in more detail in the following chapter.

9.3.6.1.2. DIGITAL - RELATED METHODOLOGICAL COMPETENCE

The DiCoSP study understood digital methodological competence as a disposition to be able to act in a self-organized, creative, critical, responsible, and goal-oriented manner within an organizational structure on the basis of school psychological resources - a set of personality traits, school psychological knowledge, skills, and attitudes - in professional digital-related situations with methodological requirements, to structure the work process, and to select, apply, and evaluate digital solution

strategies independently, appropriately, and in a manner appropriate to the situation, as well as to further developed methods.

An example of the DiCoSP matrix showed which **skills of digitally related methodological competence** can be included in the work field Administration/Professional Development in relation to lifelong learning and professional collaboration (Overview of the entire digital competence framework in APPENDIX 13):

TC = technological competence; IDC = information and data competence

LIFELONG LEARNING, CONTINUED EDUCATION AND TRAINING	○ SPs use digital resources (digital learning formats, academic blogs, explanatory videos, digital professional networks, distance learning, digital personal learning networks, communities of practice...), □ to update their knowledge of current school psychology topics and research findings IDC □ to update their digital competence TC
PROFESSIONAL COLLABORATION/ NETWORKING	○ SPs use digital resources for professional interaction and collaboration TC ○ SPs can digitally research, find, access, navigate among, filter, interpret, organize, process, store, retrieve, forward serious professional information to achieve set goals in their own digital competence and knowledge acquisition IDC

TABLE 34 showed which ITEMs of the DiCoSP questionnaire were used to assess methodological competence and the respective response frequencies on importance of DC and self - rated competence:

TABLE 34 *Questionnaire ITEMs to evaluate digitally related methodological competence and percentage of response frequencies on importance of DC and feeling competent*

Digitally related METHODOLOGICAL COMPETENCE KNOWLEDGE N=181 MCK		**% IMPORTANT**	**% COMPETENT**
G2Q00003 SQ013	I know technical solutions to protect confidentiality in digital consultations	81%	39%
G200003 SQ005	I know how to protect my own digital identity	83%	60%
		82%	**49%**

Digitally related METHODOLOGICAL COMPETENCE SKILLS N=181 MCS		**% IMPORTANT**	**% COMPETENT**
G2Q00003 SQ024	I can systematically evaluate my digital applications	59%	29%
G2Q00003 SQ001	I can use various digital tools safely and creatively (e.g. email, PDF, PPT, Zoom, BigBlueButton	98%	96%
G2Q00003 SQ003	I can organize, store, retrieve, and send reports digitally	89%	97%

G2Q00003 SQ009	I can design and present an SP topic digitally in a variety of formats (e.g., PDF, PPT, video, audio, photo, blog), e.g., guidance for parents on dealing with school lockdown	76%	70%
G2Q00003 SQ011	I can write simple programs	19%	10%
G2Q00003 SQ015	I can use assistive resources to enable digital participation of students with disabilities.	54%	15%
G00003 SQ008	I can effectively use digital tools (e.g., Etherpad) in collaborative casework with colleagues.	45%	29%
		63%	**49%**

DIGITALLY RELATED METHODOLOGICAL COMPETENCE MC ATTITUDES N=181 MCA		**% IMPORTANT**	**% COMPETENT**
G2Q00005 SQ012	I try to analyze difficulties encountered online, find an improvement, and try it out next time	83%	80%
G2Q00005 SQ011	I like to deal with technical devices	66%	57%
		74%	**68%**

Programming is an advanced digital-related skill (CARRETERO, VUORIKARI, PUNIE 2017). Thus, ITEM G2Q00003 SQ011 allowed to evaluate SPs attitude toward different levels of DC. TABLE 35 presented the results of *ITEM G2Q00003 SQ011*:

ITEM G2Q00003 SQ011 I can write simple programs to make my office work easier, N =181			
Reply DC Importance	**Percent**	**Reply Competence**	**Percent**
Not important at all	33%	**Not competent at all**	63%
Rather not important	48%	**Rather not competent**	27%
Rather important	16%	**Rather competent**	8%
Very important	3 %	**Very competent**	2%
Σ	100%	**Σ**	100%

TABLE 35 *Frequency of responses on ITEM G2Q0003SQ011 'I can write simple programs to make my office work easier'*

While 19% of the SPs surveyed considered the ability to write simple programs for administrative purposes to be important in school psychology practice, 10% of the respondents felt competent in doing so. This result offered reason to believe that advanced digital methodological skills were of rather low relevance in school psychology practice and the related competence tended to be low among SPs.

Respondents were further asked to rate the ability *G2Q00003 SQ013 "I know technical solutions to protect confidentiality in remote counseling"* in terms of importance for their practice and their own competence (TABLE 36).

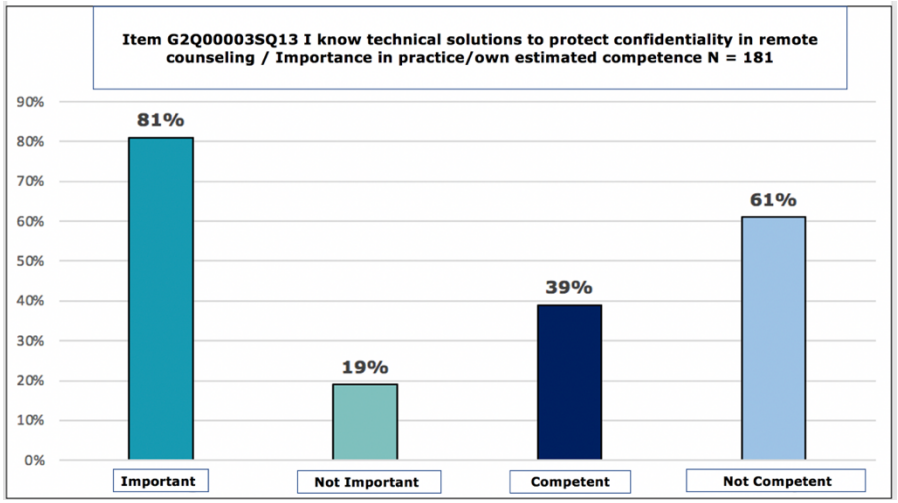


TABLE 36

Frequency of responses on ITEM G2Q00003SQ013 Knowledge of technical solutions to protect confidentiality in remote counseling

In the DICOSP competence framework, this question concerned the knowledge base of digital methodological/technological competence. 81% of respondents considered the knowledge of technical solutions to be able to protect confidentiality in digital consulting to be important. 39% of respondents felt competent to do so, although 92% use digital resources in counseling *(ITEM G2Q00004SQ001).*

This high discrepancy of 42% raised critical questions. What are adequate conditions for SPs to use remote counseling? Who is responsible for technical problem solving in remote counseling? If SPs are not responsible for technical problem solving, how is the cooperation between SPs and dedicated persons for technical problem solving regulated? Besides the cognitive dissonance between appreciation of DC and skepticism about the use of digital resources in practice, this was a further dissonance of professional ethical standards between appreciation of DC in counseling situations and competent implementation in professional practice. Given the high importance of client privacy, confidentiality, and secrecy in psychological practice, the dissonance was not trivial. It required clarification for school psychology as a profession on how to find a balance between ethics and technology (STIFEL et al. 2020, SONG et al. 2020). The solution of such a dilemma situation should be subject to guidelines of digital-related school psychology practice to be able to give SP legal certainty in their workplace. This is probably one of the most challenging tasks for the future, because European and national data protection legislation - certainly for good reasons - is a major hurdle for digital collaboration in education and health, in addition to several legal regulations (patients' rights, telecommunication law, tele media law...). This hurdle can only be overcome through intensive collective exchange and coordinated collaboration among multidisciplinary and multi professional stakeholders.

A study on the DC of psychology students in Freiburg (SAILER 2021) stated similar results regarding methodological and technological competence.

Large differences were found between students of the Faculty of Technology and the Behavioral Sciences, which included the Department of Psychology, in "solving complex situations by using digital tools" and in "protecting privacy in complex digital environments." Behavioral Science students felt significantly less competent in this area than Technical Faculty students (STEMMANN 2016).

The GEPEDU SPs' DC profile also came to a slightly below-average result compared to the reference group in "solving technical problems" (41.6% vs. 48.9%). The question arose as to why it is that methodological-technical expertise was apparently not an attractive topic for SPs.

The result of limited digital methodological competence of SPs corresponded with the result of the DICOSP - survey on key competences of the 21st century. ITEM G2Q00005 *Please rate how important you think the following skills are for a digital way of working in the practice of SP (not at all important to very important) and whether these skills apply to your own practice (yes/no)* asked for the assessment of 13 key competences in school psychology practice, including the attitude of 'affinity for technology' as a possible influencing factor on digital usage (TABLE 37 *).*

TABLE 37 *Questionnaire ITEMs related to key competences and frequency table on assessment of DC importance and own competence*

KEY COMPETENCES				
ITEM	**Question content**	**Important=%**	**Yes=%**	**Key Competence**
G200005SQ001	I am willing to actively engage in change (e.g., offer an online calendar for meeting appointments)	89%	82%	Openness to change
G200005SQ002	I can deal with complexity, e.g. by alternating synchronous/asynchronous or online/offline work	89%	85%	Resilience, coping with complexity
G200005SQ003	I can endure uncertainties and deal with risks, for example, by conducting an online consultation sometimes without having everything under control technically.	89%	83%	Dealing with ambiguity
G200005SQ004	I am good at prioritizing when dealing with a flood of emails	98%	90%	Setting priorities
G200005SQ005	I can organize myself well in the face of increasing flexibility in working hours and jobs	98%	93%	Self-organization
G200005SQ006	I manage to establish a personal relationship even in digital communication	97%	94%	Relationship Ability
G200005SQ007	I like to learn new things	98%	96%	Willingness to learn
G200005SQ008	I can think agilely, for example, by making suggestions to my employer on how to digitally improve the service offering	73%	59%	Agility

G200005SQ009	During the school shutdown, I took responsibility for a digital way of working despite many concerns,	93%	88%	Personal responsibility
G200005SQ010	I am confident that I can effectively apply digital resources in my job	89%	88%	Self-efficacy beliefs
G200005SQ011	I like to deal with technical devices	66%	57%	Affinity for technology
G200005SQ012	I make an effort to analyze difficulties encountered online, find an improvement, and try it next time	83%	80%	Result-oriented, planful action
G200005SQ013	issues	83%	79%	Conflict skills
G2Q00003SQ14	I am able to consider my own digital wellbeing, e.g. by setting limits between work and private life	96%	87%	Welfare
Mean		**88%**	**83%**	

Although on average 83% of the respondents thought they were competent regarding key competences and 88% considered key competences to be important in their practice, the attitude "technical affinity" had the lowest rating with 66% of the respondents who estimated technical affinity to be important in their practice and 57% who thought they were technically affine.

Social pedagogues were attributed a blanket technology distance as an explanatory cause (STEFFENS 2009) for their attitude with a primacy of face-to-face counseling. In this study, no statistically significant relationship (MEASURED BY ITEM G2Q00005SQ11 'I LIKE TO DEAL WITH TECHNOLOGY') was found between technology affinity and the attitude towards remote work with students (APPENDIX 23 SIGNIFICANCE TEST 37). It was therefore reasonable to assume that the SP's low interest in advanced DC and methodological skills could be related to the professional group's low affinity for technology.

The application of electronic tests was viewed as a methodological skill. A statistically significant relationship was found between affinity for technology (Item G2Q00005SQ11) and knowledge of electronic tests (ITEM G2Q00003SQ017). Based on the results, it could be assumed that more SPs with an affinity for technology had knowledge of electronic testing procedures than SPs without an affinity for technology. However, due to statistically insignificant results, technology affinity did not appear to have any influence on the use of digital resources (APPENDIX 23, SIGNIFICANCE TEST 39) and appeared to be unrelated to the attitude towards DT (APPENDIX 23, SIGNIFICANCE TEST 37). This result corresponded to the already identified dissonance between high appreciation of DC but skepticism towards the increased use of digital resources in practice among 34% of those surveyed. It could also be concluded that advanced digital

methodological skills were influenced by other factors than technical affinity.

The key competence ‚client orientation' played a special role for the methodological digital competence. *ITEM G2Q00003 SQ015 "I can use assistive resources to enable the digital participation of students with disabilities"* asked the respondents to consider the importance of this skill in their practice as well as to assess their own DC. While 66% of DICOSP respondents felt competent to address the digital needs of young people in their professional practice (ITEM G2Q00003 SQ018), only 15% felt competent to use assistive digital resources for children and young people with disabilities, while 54% considered this competence to be important.

In the context of expanding inclusive education and child rights-based school psychology practice, the issue of digital access for impaired students cannot be neglected. In 2019, the Council of Europe admonished (LUNDY et al. 2019, p.19):

- Health professionals should consult with children with disabilities to explore opportunities to use digital technology to remove barriers and improve access to services for children with various disabilities;
- Provide health websites in formats that are accessible to children with all disabilities;
- Make children with disabilities fully aware of the availability of online health information.

For SPs, these reminders imply, among other things, that the websites of SPs should be designed barrier-free according to the EU Directive 2016/2102 on barrier-free access to websites and mobile applications of public authorities. This was still rarely done in school psychological services (example Schleswig-Holstein school psychological service) and was in an initial development (see webinar offer for SP in UK).

It could be assumed concluded that SPs were least likely to regard digital methodological skills as an important part of their DC and were also least likely to regard themselves as being competent in this area compared to other classes of DC. Digital methodological competence appeared to be influenced by other factors technical affinity and a general attitude towards DT. Only regarding knowledge digital methodological competence seemed to be significantly related technical affinity.

9.3.6.1.3. DIGITALLY - RELATED PERSONAL COMPETENCE

The ethical MetaCode of EFPA provided that psychologists behave with integrity by being committed to self-reflection and openness with regard to personal and professional boundaries. This corresponded with

WENZEL's (2015) comments on the media-reflective professional competence of counseling staff. *"The integration of electronic media into everyday counseling is a very complex process, which takes place in such a way that interested and curious counselors usually lead the way in working with new media and others follow later, if encouraged by management. At the organizational level, the greatest challenges are to ensure that the* ***professionals are media-reflective and that they have adequate technical equipment.*** *However, with regard to the funding and responsibility of counseling via electronic media, there is also a need for processing at the association level and the political level."* (WENZEL 2015, p.48, free translation)

ITEM *'G2Q00003 SQ016 I self-critically reflect on my own digital practice and actively develop it further', a*ddressed the **media-reflective personal competence** of SPs, whereby this ability was to be assessed in relation to its importance in school psychology practice and in relation to the SP's own competence. In the DICOSP competence framework, this attitude ranked as one of the basics of personal competence. While 81% of respondents felt it was important to assess their own digital practice, 56% considered themselves capable of doing so. If almost half of the respondents (44%) did not consider themselves to be competent to critically reflect on and further develop their remote practice, this confirmed WENZEL's conclusion, in view of the professional ethical obligation, that **media-reflective professional competence is still a challenge also for SPs in practice.**

9.3.6.1.3.1. AGILE MINDSET

According to the NORTH competence wheel (NORTH et al. 2005), 'readiness for change' and 'agility' represented important digital social and personal skills. 'Willingness to change' was understood to mean the following knowledge, skills, and attitudes:

- Seeking and finding new ways and being ready for innovations
- Recognition of need for change
- High willingness to change
- Pursue of opportunities in change and transformation
- Positive adoption and push of new developments
- Willingness/ability to learn
- Creativity.

‚Agility' included skills such as

- quick adaptation to changing situations and conditions
- quick development of goal-oriented solutions in problem situations.

'Agility' played an important role in the framework of digitally competent organizations (HOFERT 2018, DWECK 2007). A resilient organization could

deal with shocks and disruptions, such as those of DT, in a self-regulating manner by finding a balance between the elements of robustness, agility, and stability (WÜTHRICH 2015).

A result of the GEPEDU 'Average Profile SP' showed for the ITEM 'Commitment and Work Attitude - Agility & Willingness to Change' a slightly below average value of 67.1% for the SP compared to the reference group with 72%.

In the DICOSP questionnaire, 'agility and willingness to change' was surveyed by the following two questions, to be assessed according to the importance of DC and one's own competence: '*G200005 SQ001 I am willing to actively engage in change (e.g., offering an online calendar for appointments)' and 'G200005 SQ008 I can think agilely, e.g., by making suggestions to my employer on how to digitally improve service delivery - Does this skill apply to your own practice?'* (TABLE 38).

TABLE 38 *Response frequencies on ITEMs G2Q00005 SQ001 and SQ008 (agility and readiness for change)*

ITEM G2Q00005SQ001 How important is it to be ready to actively engage in change by e.g. by offering an online calendar for appointments N = 181	
Response	%
Important	89%
Not important	11%
Σ	100%

ITEM G2Q00005SQ001 Are you ready to actively engage in change by e.g. by offering an online calendar for appointments N = 181	
Response	**%**
Yes	82%
No	18%
Σ	100%

ITEM G2Q00005SQ008 How important is it to be able to think agilely e.g. by suggesting to the employer how to digitally improve the service N = 181	
Response	**%**
Important	73%
Not important	27%
Σ	100%

ITEM G2Q00005SQ008 Do you feel able to think agilely N = 181	
Response	**%**
Yes	59%
No	41%
Σ	100%

Most respondents stated that they were competent in most of the knowledge, skills, and attitudes base of digitally related social and personal competence (*ITEM G200005*) and considered this competence to be important in their practice. E.g. 89% of the PTPs found 'readiness for change' important and 82% felt ready for change. Fewer respondents (73%) considered an agile mindset to be important and 59% considered to have an agile mindset (TABLE 38). If round about 40% of the respondents did not consider having an agile mindset, this might have been a reason for a rather reactive attitude towards DT. This pattern of dealing with DT was obviously reflected in the responses on ITEM G4Q00002 asking for the driving factors of DT in school psychological practice (TABLE 29).

Respondents rated the following factors as drivers of DT in school psychology *(G4Q00002):*

- **91% of** respondents saw the **Covid - 19 pandemic as the main driver** of DT in school psychology practice.
- **63%** mentioned positive experiences with remote work (facilitated communication and collaboration**,** saving of travel time and costs).
- **50% of** respondents found **that it was easier to get in contact with students via digital media;**
- **41%** thought that **improved digital infrastructure** was a driving factor.

Two-thirds of the responses were related to a rather reactive than active-creative attitude towards DT. Restrained agility could have been a consequence of labor law uncertainty in remote professional activity or a characteristic of the profession of psychology. The German Council of Science and Humanities critically noted: "*Furthermore, the Council of Science* and *Humanities has observed that psychology takes up usual phenomena - for example, effects of a more or less extensive use of digital technologies on social behavior and experience - only late and makes them rather hesitantly subject of its research.*" (WISSENSCHAFTSRAT 2018, p.82, free translation)

SPs themselves pointed to the importance of an agile mindset in light of the COVID-19 pandemic: *"An agile mindset could help us become more open to new possibilities and not only explore and use them when we are forced to do so by external circumstances."* (BACHMANN et al. 2021, p.6)

9.3.6.1.3.2. SELF EFFICACY

The BIDT study (LÜHR et al. 2020) examined the question of how people deal with the challenges of digital transformation. The results showed that experiencing DT with fear, hope or optimism essentially depended on how the impact of professional ability was evaluated and how the results of actions were perceived (perception of own self-efficacy). Asked about perceiving their own self-efficacy. **89% of respondents** considered the **experience of self-efficacy in remote work to be important** and **86% felt self-efficacious** (*G200005 SQ010 I am convinced that I can use digital resources effectively in my profession - Please rate how important this skill is for a digital way of working in SP practice (not at all important - very important) and whether these skills apply to your own practice (no - yes)- TABLE 39)*.

TABLE 39 *Assessment of the factor of self – efficacy ‚I am confident that I can effectively* apply digital resources in my job' *and knowledge of professional digital competence 'I understand the impact of digitization on School Psychology*

ITEM G2Q00005SQ010 Self – rated self – efficacy N = 181	
Response	%
Yes	45%
Rather Yes	41%
Rather No	9%
No	5%
Σ	100%

ITEM G2Q00005SQ010 Estimated importance of self – efficacy N = 181	
Response	%
Very important	47%
Rather important	42%
Rather not important	10%
Not at all important	1%
Σ	100%

TABLE 40 *Assessment of the knowledge of professional digital competence 'I understand the impact of digitization on School Psychology*

ITEM G2Q00003 SQ023 I understand the impact of digital transformation on school psychology N=181			
Knowledge is important	**Knowledge is not important**	**Understanding the impact of DT on School Psychology**	**No understanding of the impact of DT on School Psychology**
87%	13%	67%	33%

87% of the PTPs considered the understanding of the impact of DT on the school psychology practice to be important and 67% believed that they understand this impact (TABELLE 46). This result corresponded with the finding that 46% of the respondents felt insecure in assessing the importance of DC and the increase of digital resources in their professional practice (chapter 9.3.5.1.). According to the results of the BIDT-study most surveyed SPs seemed to be well equipped in dealing with the DT in their professional practice.

9.3.6.2. RESULTS ON PROFESSIONAL DIGITAL COMPETENCE

The DiCoSP questionnaire results were evaluated according to the professional DC classes of information and data competence (IDC), communication competence (CC), media competence (MEC), and technology competence (TC). A description of competence classes can be found in APPENDIX 3.

9.3.6.2.1. ASSESSMENT OF OWN PROFESSIONAL DIGITAL COMPETENCE

Professional DC was understood as a transversal competence enabling people to cope with digital challenges in general. To be able to determine which elements of professional DC were important in school psychology practice, ITEMs of the DiCoSP - online - questionnaire were matched with the areas INFORMATION AND DATA COMPETENCE (IDC), COMMUNICATION COMPETENCE (communication and collaboration COCO), TECHNOLOGY COMPETENCE (security SEC and problem solving PBL/ TC) as well as MEDIA COMPETENCE (MEC) according to the European Digital Competence Framework (DiGCOMP) (APPENDIX 12).

The competence classes were rated by respondents according to their importance for the professional practice and self-assessed own competence as follows:

TABLE 41 *Percentage frequency of responses on ITEMs identifying professional digital competence and key competences of SPs*

DIGITAL COMPETENCE CLASSES N = 181	Important %	Competent %	Difference	Comparative value GEPEDU- SP Profile (max. score of 100%)	Comparative value GEPEDU- SP Self - Assessed Profile (max score of 100%)
INFORMATION AND DATA COMPETENCE IDC	82%	72%	10%	75%	71%
COMMUNICATION COMPETENCE CC	73%	60%	13%	68%	65%
TECHNOLOGY COMPETENCE TC	77%	46%	31%	80%	52%
MEDIA COMPETENCE MEC	55%	36%	19%	72 %	56%
MEAN	**72%**	**53%**	**19%**	**75%**	**62%**
KEY COMPETENCES	88%	83%	6%	70 %	

On average, 72% of respondents found the basics of professional digital competence important and 53% SPs felt being competent in the digital competence classes (TABLE 41). Compared to key competences, professional digital competences were important by 16% fewer respondents and 30% fewer respondents felt competent in professional digital competence classes. Most respondents (72%) felt competent in **information and data competence**, followed by communication competence, then technology competence. **Least was media competence**, both in terms of importance in professional practice and self-assessed own competence.

This competence assessment suggested that SPs used digital technology more in the classical sense as a means of information and communication ("Web 1.0") and less as a tool for actively, creatively shaping school psychology work, producing or influencing digital content, and collaborating through networking ("Web 2.0").

The highest discrepancy of 31% was stated between the frequency of assessed importance of technology competence and the self-assessed own technology competence compared to the other professional competence classes, as mentioned before (Chapter 9.3.6.1.2.).

9.3.6.2.2. DIGITAL INFORMATION AND DATA COMPETENCE (IDC)

IDC was assessed in the DICOSP questionnaire by the following ITEMs with the response options important (very/ rather important) and competent (very/ rather competent) (TABLE 42):

TABLE 42 *Percentage frequency of responses on ITEMs analyzing IDC*

INFORMATION AND DATA COMPETENCE (IDC)				
ITEM	**Digital information and data literacy in school psychology practice (IDC) N=181**	**Percentage of respondents with an assessment of DC as important (very/very much)**	**Percentage of respondents with their own competence assessment (very /somewhat competent)**	**Difference in percent between both assessments**
G2Q00003 SQ003	I can organize, store, retrieve, and send reports digitally	88%	97%	8%
G2Q00003SQ001	I can use various digital tools safely and creatively (e.g. email, PDF, PPT, Zoom, BigBlueButton).	98%	96%	2%
G2Q00003 SQ002	I can find digital specialized information, such as psychological databases, scientific blogs, on the Internet and analyze, interpret, and filter it for quality	71%	75%	4%
G2Q00003 SQ017	I know electronic test procedures for students and can critically evaluate their psychometric qualities.	68%	48%	20%
G2Q00003 SQ020	I know what information about students may be stored	83%	44%	39%
Mean		**82%**	**72%**	**10%**

The frequent appreciation and mastery of skills as searching, filtering, and managing digital data, information, and content was reflected in frequent appreciation of DC and use of digital resources in administrative work (90%/91%) and in report writing (87%/90%).

Data storage and analysis of digital information was important by fewer respondents and was also less mastered (TABLE 42). A 39% difference occurred between the estimated importance and the self-rated DC in storing student data. Also in the GEPEDU - competence profile of the SP, the self-assessed **knowledge base of ICD** (data storage, rights, and obligations on the Internet) was slightly below average, although the actual performance in data storage was slightly above average at 76.1%.

About a quarter of respondents did not feel competent to find and assess digitally professional school psychology information. In *ITEM G3Q00005 (Which of the CPD formats did you use for digital skills acquisition and did you find helpful in your professional practice?),* 27% of respondents reported using digital professional literature as a helpful learning format, and 4%

scientific blogs (TABLE 52). These findings corresponded to the results of comparable studies on psychologists' information behavior.

Table 6. Differences in Tasks of Salaried Respondents Between Work Settings

Tasks	CLB/CPMS/ Kaleido
	M (SD)
Supporting individuals & their environment	4.45_a (0.62)
Supporting organizations	4.08_a (0.81)
Managerial tasks	2.22_a (1.22)
Supervision	2.55_a (1.07)
Policy and governance	2.24_a (1.13)
Training and education	2.52_a (1.13)
Scientific research	1.42_a (0.67)
Administrative tasks	3.93_a (0.88)

TABLE 43 *Tasks of SPs in BE (Source: SPILT 2021, p.38)*

There were several research studies on IDC of psychologists (LEICHNER et al. 2015, MAYER et al. 2016, ACRI 2010, BAUER et al. 2012, BECKER 2004, MITTELMANN et al. 2022). According to a 2003 BDP member survey on professional information needs and behaviors, 21% of educational psychology respondents indicated a need for professional psychological information (KRAMPEN et al. 2004). Providing and finding scientific information is especially relevant in the role of the scientific practitioner and for an evidence - based practice of SP. As the Belgian study (SPILT et al. 2021) stated (TABLE 43), was the amount of scientific work in school psychology services in the German speaking community of BE very low. This may have been one reason for the low usage of professional digital information resources.

As BAUER et al. (2012) stated SP used nearly no digital communication formats as blogs or social networks and used rarely psychology related data bases as source of information, because the acquisition of information and the availability of information services were not efficient enough and the trustworthiness of sources was uncertain in view of the open access opportunities for publications. Practitioners compared to researchers preferred more user-friendliness of information sources.

The study by BITTERMANN et al. 2021 suggested, that social media are now a thoroughly worthwhile source of information for psychologists. The study concluded that Twitter mining, for example, is suitable for identifying current psychological topics, especially in relation to social issues, novel research methods and research topics in psychology (Chapter 9.3.6.2.4.).

9.3.6.2.3. DIGITAL COMMUNICATION COMPETENCE (CC)

Digital communication competence (CC) was addressed in the DICOSP questionnaire by the following ITEMs:

TABLE 44 *Percentage frequency of responses on ITEMs related to the professional digital communication competence class for the assessment of the DC importance and SPs' own DC.*

ITEM	Digital competence psychology N=181	communication in school practice (KK)	Percentage of respondents estimating CC as important (very/very much)	Percentage of respondents self-rating as communication competent (very /somewhat)	Difference in percent between both assessments
G2Q00003SQ006	I can communicate digitally, e.g. via Zoom, WhatsApp, Snapchat, according to the needs of my target group/person		80%	88%	8%
G2Q00003SQ018	I consider the importance of digital tools for young people		88%	66%	22%
G2Q00003SQ005	I know how to protect my own digital identity		83%	60%	23%
G2Q00003SQ007	I network with partner organizations to promote the healthy development of children (e.g., children's and youth networks in Austria).		68%	58%	10%
G2Q00003SQ008	I can effectively use digital tools, such as Etherpad, in case work		45%	29%	16%
Mean			**73%**	**60%**	**13%**

Two-thirds of respondents (60%) considered themselves to be competent in digital communication and collaboration 73% also considered this competence to be important. The greatest difference in the frequency of assessed DC importance and self-assessed own competence, at 23%, was in protecting one's own identity, which in turn was linked to the knowledge base of DC. Digital networking with partner organizations to promote healthy child development was found to be important by 68% and 58% of the respondents felt competent to do so (TABLE 50). Similar to IDC in using digital reports and administratively relevant communication tools, most respondents (88%) was able to use digital tools to communicate according to the needs of their target groups/individuals.

ITEM G2Q00004SQ016 USE OF DIGITAL RESOURCES IN COLLEGIAL COLLABORATION/. SUBJECTIVE DIGITAL COMPETENCE ASSESSMENT N=187v	Beginner %	Competent person %	Digital Expert %	% Σ
Frequently	12%	35%	19%	66%
Occasionally	7%	17%	6%	30%
Never	2%	1%	1%	4%
Σ	21%	53%	26%	100%
Σ frequently + occasionally	19%	52%	25%	96%

TABLE 45 *Percentage response frequencies on ITEM G2Q00004SQ016 Use of digital resources for collegial cooperation categorized by DC level*

89% of respondents considered DC to be important in communicating with their target groups/individuals and 87% in collegial collaboration, with 94%-95% of respondents using digital resources in these work fields. 19% of digital novices, 52% of digitally competent SPs, and 25% of digital experts used frequently or occasionally digital resources for collegial collaboration (TABLE 45). It could be assumed that most SPs valued digital communication competence and used digital resources in the related work fields as collegial collaboration and communication with relevant partners and clients. Contributions of focus group participants and contributions to open-ended questions in the DiCoSP online questionnaire (APPENDIX 21) pointed to the benefits of digital use in terms of facilitating collaboration and communication and improved accessibility to clients, e.g., by eliminating travel time.

The estimated importance of digital CC of SP needed to be questioned as

- 34% of the respondents did not feel competent to address the digital needs of youth in their professional work (ITEM G2Q00003 SQ018),
- 40% did not know how to protect their digital identity (ITEMG2Q00003 SQ005),
- 42% did not feel competent to network with partner organizations to promote the healthy development of minors (ITEM G2Q00003 SQ007),
- 71% did not know how to effectively use digital tools, such as Etherpad, in collegial collaboration (ITEM G2Q00003 SQ008).

A series of significance tests were conducted to analyze how frequency discrepancies between the assessment of DC importance and SPs' own competence or usage behavior could be explained:

- **Relationship between digital usage and assessment of DC importance**

49% of respondents considered the competence to use digital tools in collegial casework to be important and one-third of respondents (29%) felt competent to do so (*ITEM G2Q00003 SQ008 I can use digital tools, such as Etherpad, effectively in casework).* A statistically **significant** relationship was found between the frequency of use of digital resources in collegial collaboration and the assessed importance of DC in collegial case work (APPENDIX 23 SIGNIFICANCE TEST 4). It could be assumed that more SPs who consider DC to be important used digital tools frequently or occasionally in collegial collaboration than SP who considered DC not to be important.

- **Relationship between digital usage and self-assessed DC**

No statistically significant correlation was found between the frequency of use of digital resources in collegial collaboration and the self – rated own DC. Both characteristics were statistically independent. (ANHANG 27 SIGNIFIKANZTEST 16)

- **Relationship between self-rated importance of DC and country of employment**

No statistically significant relationship could be found between the country of employment and self – rated own DC (APPENDIX 23 SIGNIFICANCE TEST 32)

- **Relationship between the use of digital resources in collegial collaboration and attitudes toward digital transformation**

A statistically significant relationship between the use and digital resources in collegial collaboration and attitudes toward DT was stated. SPs who considered DT to be an enrichment of school psychology were almost six times more likely to use digital resources in collegial collaboration than SPs who were skeptical about the transformation (TABLE 52). Testing the relationship between 'expected impact of digital transformation on school psychology' and 'use of digital resources in collegial collaboration' resulted in a statistically **significant** relationship (APPENDIX 23 SIGNIFICANCE TEST 24). It was assumed that more SP who regarded DT as an enrichment used digital resources in collegial collaboration than SP who expected no changes or an impoverishment of school psychology by DT.

TABLE 46 *Response frequency on ITEM G5Q00004 and G2Q00004SQ016 Relation between use of digital resources in collegial collaboration and attitude towards the impact of digital transformation on School Psychology*

ITEM G5Q00004 I believe digital transformation will transform school psychology… /ITEM G2Q00004SQ016 How often do you use digital resources in collegial collaboration? N =184	FREQUENT USE OF DIGITAL RESOURCES IN COLLEGIAL COLLABORATION	OCCASIONAL USE OF DIGITAL RESOURCES IN COLLEGIAL COLLABORATION	NO USE OF DIGITAL RESOURCES IN COLLEGIAL COLLABORATION
Stagnation/impoverishment of school psychology.	7%	7%	2%
Enrichment of school psychology	58%	23%	3%

A statistically significant relationship between the 'assessment of online and offline work groups as being equal' and the 'use of digital resources in collegial collaboration' could be found. It could be assumed that SPs being open to DT used digital resources more frequently in collegial collaboration than respondents who rejected the equivalence of online and offline working groups (APPENDIX 23 SIGNIFICANCE TEST 51).

- **Relationship between the estimated DC importance in collegial cooperation and country of employment**

The estimated importance of DC differed among the studied countries (TABLE 53).

TABLE 47 *Response frequency on ITEM G2Q00004SQ001 Importance of DC in collegial cooperation per country*

ITEM G2Q00004SQ001 How important do you think digital competence is in collegial collaboration?	ALL% N=189	DE% N=107	BE% N=12	AT% N=30	CH% N=40
Digital competence important in collegial collaboration	87%	93%	92%	87%	70%
Digital competence unimportant in collegial collaboration	13%	7%	8%	13%	30%

A significance test between the 'country of employment' and the 'estimated importance of DC in collegial cooperation' stated a statistically **significant** result, whereby it can be assumed that more German than Swiss respondents considered DC in collegial cooperation to be important (APPENDIX 23 SIGNIFICANCE TEST 8).

- **Relationship between use of digital resources in collegial collaboration and country of employment**

The use of digital resources in collegial collaboration differed among the studied countries. More Swiss than respondents of other studied countries used no digital resources in collegial collaboration (TABLE 48).

G2Q00004SQ Frequency of digital resource use in collegial collaboration/Country of employment	DE% N=107	BE% N=12	AT% N=30	CH% N=40
Frequently/occasionally	98%	100%	100%	82%
Never	2%	0%	0%	18%

TABLE 48 *Frequency of use of digital resources in collegial collaboration per country*

The significance test found a **significant** relationship between the 'usage of digital resources in collegial collaboration' and 'country of employment' (APPENDIX 23 SIGNIFICANCE TEST 52). It could be assumed that more Swiss SPs did not use digital resources in collegial collaboration than SPs from AT and DE. This assumption seemed plausible because significantly more Swiss than German respondents expected no or a negative impact of DT on school psychology (APPENDIX 23, SIGNIFICANCE TEST 22).

In summary, it can be assumed that professional digital communication competence plays a crucial role in school psychological counseling and collegial cooperation. There was a clear connection between the use of digital resources in collegial collaboration and the attitude towards DT in form of estimated importance of DC, the expected impact of DT on school psychology and the attitude towards professional online and offline activities as equal. This finding was similar to the results in the work field of counseling. There was also a relationship between these attitudes and the country of employment as well as between the country of employment and the use of digital resources in collegial collaboration, so that it can be assumed that attitudes towards DT are culturally mediated. This finding supported the UTAUT theory, which considered social factors as one of the four important drivers of technology acceptance and application. A further driving force was the output expectation reflected in the DiCoSP results in more frequent use of digital

resources if an enrichment of professional practice was to be expected as a positive effect of DT.

9.3.6.2.4. DIGITALE MEDIA COMPETENCE

9.3.6.2.4.1. MEDIA COMPETENCE

Digital media competence included

- Knowledge of and access to a wide variety of digital resources and digital content
- Understanding and critical evaluation of the meaning and impact of digital media and content,
- The development and production of digital messages (selection of appropriate digital resources, use of common application software, creation, design and presentation of data, information, content in various formats, dissemination of content via various digital media) (*creativity, innovativeness*)
- Knowledge, handling, and consideration of legal and professional ethical regulations, e. g. copyrights and licenses in the digital space *(ethical-normative orientation).*
- Knowledge and application of programming techniques
- Processing and integration of digital information (continued processing of existing digital products, their adaptation and integration into existing knowledge)
- The pedagogical media competence.

TABLE 49 showed the ITEMs used to address media competence in the DICOSP questionnaire and the percentage frequency of responses on ITEMs regarding DC importance and SPs' self-assessed competence:

TABLE 49 *Response frequency on ITEMs to analyze media competence*

ITEM	Digital media competence in school psychology practice (MEK) N=181	Percentage of respondents with an assessment as important (very/very much)	Percentage of respondents with their own assessment as competent (very /somewhat)	Difference in percent between both assessments
G2Q00003 SQ009	I can design and present a topic digitally in a variety of formats, e.g., PDF, PPT, video, photo, blog, e.g., guidance for parents on dealing with school lockdown	76%	70%	6%
G2Q00003 SQ010	I know about copyrights and licenses	71%	28%	42%
G2Q00003 SQ011	I can write simple programs to facilitate my office work	19%	10%	9%
		55%	**36%**	**19%**

Media competence was considered least important by respondents compared to the other professional digital competence classes (55%), and the fewest respondents (36%) felt competent in it. The creative side of media competence required, compared to CC and IDC, advanced competence in the digital-technical and legal areas. In this respect, there is a large overlap between methodological and media competence. The ability of programming has already been dealt with in the context of methodological competence (chapter 9.3.6.1.2.) with the conclusion that advanced digital methodological competence did not seem to be highly relevant for SPs in practice. Since possible reasons did not lead to a clear result with the aspect of methodological competence, the results for the three media competence-related items were analyzed again as an intersection with digital-related methodological competence.

Advanced media competence included additionally the challenging task of developing school psychology software for online interventions. RITTERBAND (2003) stated, based on his research on conditions of the development of online interventions, that psychologists needed to accept that technology is changing the world. This required a way of working with unusual sets of multidisciplinary teams to develop new treatment interventions. He described the extensive conditions and process for developing software for online interventions:

"Developing Internet interventions is an arduous, sometimes tedious, and always time-intensive process. It necessitates an interdisciplinary approach, requiring a team of diverse professionals, including clinicians and other health care providers to provide content; computer and Web programmers to build essential applications; Web designers to create the Web structure; Web graphic artists to create still and animated images; database developers to integrate a mechanism to store and retrieve data; health informatics evaluators to evaluate user interface issues and outcomes; and behaviorists to incorporate behavior change concepts into the system. Other potential members of the team may include business/financial advisors to ensure proper marketing, management, and sales; videographers to create video; audio engineers to integrate Web audio; psychometricians to certify appropriate scale integration; tech support personnel to provide user support; cost-analysis specialists to determine savings; linguists/translators to provide readability testing and translation; disability experts to oversee usability issues; and health educators to make certain the content is structured in such a way that the majority of users will find it helpful." (RITTERBAND et al. 2003, p.533)

This study could not answer the question whether SPs had necessary resources to create online interventions, but it was likely that SPs were interested in being able to use evidence-based online resources to enrich their psychological practice, such as the use of the WOOP APP to promote self-regulation, social skills, and self-management in students with an ADHD diagnosis (BLUME et al. 2018). This interest also required media competence.

RITTERBAND's detailed description illustrated that media competent work in school psychology could not always be managed by SP themselves. It

required multidisciplinary and multi professional collaboration to develop and apply effective methods and products for school psychology practice.

A contribution from the expert focus groups underpinned this view: "*If you want things to work, then you need to approach it in a multi professional manner, so to speak. You need someone who has the expertise in terms of content, but you also need someone who can integrate the good, yes I would say, learning games and the like, to make such things appealing so that they are actually used. So there is also this multi-professionalism, which is simply a big key, even in school and around school, so that things can work well.*"

ITEM G2Q00002SQ009 of the DiCoSP questionnaire was related to the basic skill of creating digital content in a form that is common for school psychology practice, namely, presenting a school psychology topic in format forms such as PDF, PPT, video, photos, or blogs. 70% of the respondents felt able to do so and 77% found this skill important. Thus, it can be assumed that about three-quarters of the SPs had basic digital media competence and considered this competence to be important in their practice.

Media competence is also important in the context of the SP's role as a "psychoeducator" (LIONETTI et al. 2019). This is also about pedagogical qualifications in the context of client training and health education. Teaching "media competence" in educational settings ("pedagogical media competence") played a major role in all European educational plans. It included five different aspects: didactic media competence, pedagogical media competence, socialization-related competence, organizational development competence, and media competence (BACHINGER U.A. (2013), BEISSWENGER et al. (2020), BOCCONI FEDERAL MINISTRY OF EDUCATION AND RESEARCH (2016), CULTURE MINISTERIAL CONFERENCE (2017), REDECKER et al. (2017), YOUTH AND MEDIA NATIONAL PLATFORM FOR THE PROMOTION OF MEDIA COMPETENCES FEDERAL MINISTRY OF SOCIAL SECURITIES (2021)). This mandate was of concern for SP in the context of their preventive, psychoeducational tasks (see offer of the school psychological service PI Munich on media use). The focus was not on the acquisition of DC by learning to use specific apps or platforms, but on a fundamental understanding of the interaction between digital media and young people. Professionals in the educational sector should therefore understand how digitalization affects young people and their environment to be able to support them in the digital world. They have the task of supporting a responsible and developmentally beneficial behavior of young people in dealing with digital resources, e.g. by preventing cyberbullying, assessing excessive media use, preventing radicalization on the Internet. For example, the handbook for school psychology work in Styria (2020) mentioned that school psychology defines and evaluates guidelines on bullying/violence prevention as part of system-oriented psychological

support for schools in the area of prevention and conflict management, such as the guide on cyberbullying prevention in schools.

The DiCoSP - questionnaire, addressed the question whether SPs considered this assignment to be relevant in their professional practice by two ITEMs (TABLE 50):

TABLE 50 *Response frequency on ITEMs analyzing digital media competence*

ITEM	Digital media competence in school psychology practice (MEK) N=181	Percentage of respondents with an assessment as important (very/very much)	Percentage of respondents with their own assessment as competent (very /somewhat)	Difference in percent between both assessments
G2Q00003 SQ019	I can promote the competence of students to protect themselves in the digital space.	73%	43%	30%
G2Q00003 SQ021	I am able to help schools prevent cyberbullying	84%	44%	40%

At least three-quarters of respondents considered the mission of supporting responsible behavior in dealing with digital media to be important, and about 43% felt competent in doing so.

A comparison with the DiCoSP - reference Study on DC of Youth Workers showed that these specialists also felt less competent in media and technology competence than in communication and data and information competence. While 70% of DICOSP respondents rated themselves as being media competent in designing and presenting school psychology topics in various digital formats, 57% of youth workers (49% of German youth workers) rated themselves as being competent in designing digital content (Figure 41).

FIGURE 41 *Comparison of SPs and youth workers about 'Creation of digital content according to client's needs'*

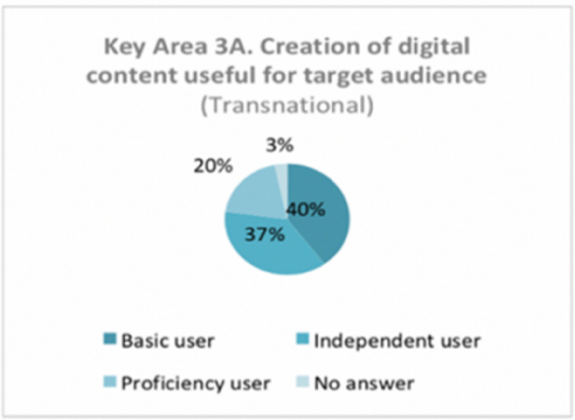
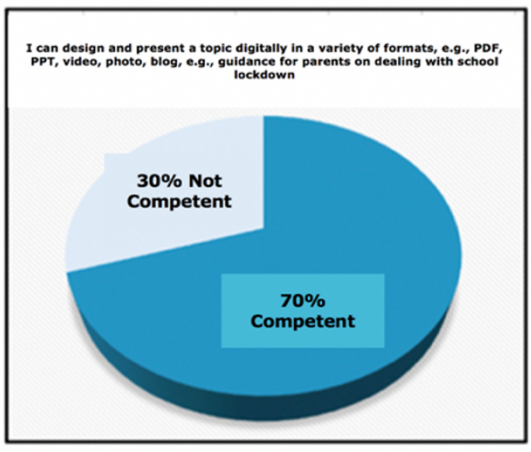
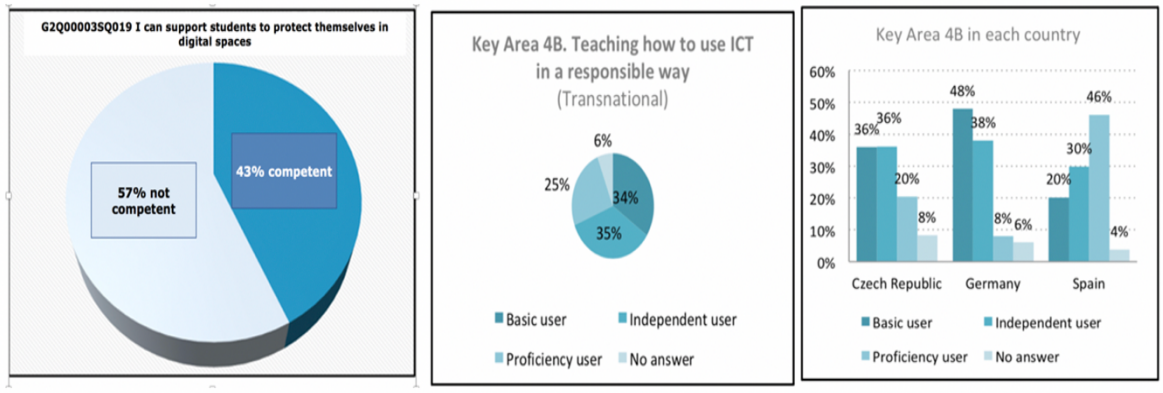


Fig. 15 Key Area 3 – Transnational (n = 475)



60% of the youth professionals (46% German) felt competent (independent or advanced) to teach students responsible digital behavior and 43% of the DiCoSP respondents (Figure 42).

FIGURE 42 *Comparison pedagogical media competence among SP and youth workers*



The difference compared with youth professionals, as well as the 30% and 40% difference in SPs' responses on DC importance and self – rated own competence (Table 54), could have been related to the distribution of tasks in the school system. Since, in addition to SP, teachers, media educators, school social workers, etc. were also responsible for media competence in schools, there was a need for clear regulation of responsibilities so that each professional group could contribute efficiently to the media competence of children and adolescents, teachers, and parents.

It was and is undoubted that SPs can and do assume a professional responsibility for these topics. Hence, it is important that SPs acquire media and communication competence. As cyberbullying prevention was seen as an important task in many SP services (ÖSTERREICHISCHES MINISTERIUM FÜR BILDUNG, WISSENSCHAFT UND FORSCHUNG 2019 A; SCHULPSYCHOLOGISCHER DIENST ALTDORF; KALEIDO-OSTBELGIEN 2022), the status of SPs among the circle of stakeholders needed and needs to be clarified in terms of professional policy.

9.3.6.2.4.2. MEDIA COMPETENCE AND INTERACTIVE COLLABORATION

As explained in the chapter of methodological competence ITEM *G5Q00002* addressed the importance of collegial online working groups compared to offline working groups (TABLE 51). It was found that 16% were unsure about their assessment, 37% were skeptical about digital collegial collaboration, and 47% were open to remote work with colleagues (TABLE 55). About half of the respondents supported digital

collegial collaboration under the condition that travel times could be saved, i.e. under the perspective of effort expectation according to the UTAUT theory. If 53% of the respondents were unsure or skeptical about digital collegial collaboration, it could not be expected that interactive digital resources were used by more than half of the PTP.

TABLE 51 *Response frequencies to ITEM G5Q00002SQ001 analyzing attitude towards remote work in collegial collaboration*

ITEM G5Q00002SQ001 To what extent do you agree or disagree with the following statement ? Collegial online working groups are... N=181	**... just as valuable as offline workgroups**	**... a good complement to offline workgroups**	**... a stopgap solution, personal contact is always preferable**	**... only useful when colleagues are spatially distant.**	
Attitude towards digital-related working methods	**Percent**	**Percent**	**Percent**	**Percent**	**% Medium**
Not sure	23%	7%	24%	12%	**16%**
No	42%	8%	35%	31%	
Yes	35%	85%	41%	57%	
Skeptical	42%	8%	41%	57%	**37%**
Open-minded	35%	85%	35%	31%	**47%**

A closer look at digital media usage patterns reflected this attitude towards digital collegial collaboration.

TABLE 52 *Percentage frequency of response to ITEM G6Q00003 Which of the following digital resources do you use in your professional practice?*

ITEM G6Q00003 **Which of the following digital resources do you use in your professional practice? N=181v**	**% = Yes**
Interactive tools, such as VR glasses	2%
Wearables	2%
MICROBLOGGING - TWITTER	2%
BLOGS AND BLOGTOOLS	4%
Foto Networks - Instagram	6%
Audiosoftware	7%
Software for image and video editing (e.g. Photoshop, Movie Maker)	8%
SOCIAL NETWORKS - META (FACEBOOK)	9%
Serious digital learning games	15%
Electronic tests	27%
Videotutorials	30%
VOIP SERVICES	32%
CLOUD MEMORY	37%
Wikis - Wikipedia	39%
WhatsApp, Snapchat	43%
Video Formats -Youtube	43%
SERVICE PROJECT PLANNING SOFTWARE, SUCH AS MICROSOFT TEAMS	44%

Website own facility	58%
Smartphone	63%
ORGANIZATION TOOLS, LIKE DOODLE	69%
PowerPoint, Prezi	84%
Digital Texts, PDF documents	86%
Zoom, Big Blue Button	89%
Computer, Laptop, tablet	96%
Office Software (Excel, Word)	96%

Responses to the question on use of digital media in professional practice (*G6Q00003 Which of the following digital resources do you use in your professional practice?)* showed that interactive work tools of collegial collaboration (TABLE 52 capital red letters) were used less frequently compared to communication tools. Digital tools enabling creative, interactive participation were used by less than 16% of respondents. Typical digital collegial work tools, such as service and project planning tools (Microsoft teams for example) were used by 45% of respondents, or cloud storage, such as Dropbox, by 37%. ITEM G2Q00003SQ008 addressed collaborative writing tools, such as Etherpad. Only 29% of the respondents felt proficient to use it. It can be concluded that while most respondents use digital tools for professional information and communication, the majority does not use digital resources as interactive work tools for professional collaboration in their practice. The figures of used interactive tools varied from one-third to just below half of respondents in contrast to non-interactive tools, such as PowerPoint, Prezi, PDF documents, or digital texts, being used by over 80%. Presumably due to the digital boost by the COVID-19 pandemic, communication tools for conversations, meetings, and conferences, such as BigBlueButton or Zoom, were used by nearly 90% of respondents. This finding matched the unusual result of frequent use of digital resources in advice, regardless of country (Chapter 9.3.5.4.1.).

TABLE 53 *Percentage response frequency on usage of training formats*

***ITEM G3Q00005* Which of the training formats for digital competence acquisition you used did you find helpful in your professional practice? N=181**	**Percentage of responses**
Informal support from friends/family/colleagues with digital experience (SQ011)	69 %
Interactive webinar by and with SP (SQ016).	38%
Interactive Web Conference by and with SP	28%

(SQ017)	
Online learning group with colleagues/SPs on digital working in a professionally relevant problem situation (SQ014).	22%
Individual Online Learning Network (SQ007)	5 %

The response frequency on used continued professional training formats (TABLE 59) showed that, apart from an informal exchange with digitally experienced colleagues, interactive collegial collaboration was considered worthwhile by at most one third of the respondent, as interactive webinar by and with SP, collegial online learning group.

Following the model "*Knowledge Staircase 4.0: Digital Technologies for Knowledge-Based Value Creation*" by NORTH & MAIER (2018), most DiCoSP respondents seem to be on the verge between the stage of information and knowledge to the stage of action or Web 2.0, which is the beginning of digital collaboration.

Web 2.0 is characterized by the following elements (LAI & TURBAN 2008):

- The collective intelligence of users contributes to the knowledge generation.
- The digital environment provides space for communication and collaboration, e.g. via social media.
- Data can be compiled in new forms ("mash up").
- Users can generate their own content (e.g., wikis, blogs, RSS, and podcasts) using simple programming techniques and digital tools.
- Networks act as platforms that enable users to run applications through browsers.

Based on the response results, it could be concluded that most respondents used digital tools in the classic sense as a means of professional information and communication, but that digital resources as an interactive working tool in professional collaboration were not used by the majority in school psychology practice. This usage pattern corresponded to a development between Internet 1.0 and 2.0 according to NORTH & MAIER (2018). This impression was consistent with HENNIGAN's 2018 study results, which concluded that digital technology was predominantly used in students' counseling for communication of administrative issues, although students had shown interest in using technology to support their mental health.

It could be assumed that approximately one third of the *surveyed* SPs use*d* interactive possibilities of the Web 2.0 and beyond for collegial collaboration and knowledge creation. These results matched the answers to the question as to which factors promoted remote working in school psychology (TABLE 29, ITEM G4Q00002SQ004), which gave the impression that most surveyed SPs dealt rather reactively than actively and creatively with digital change. A third of the respondents showed an active, creative approach, and a third also used interactive media.

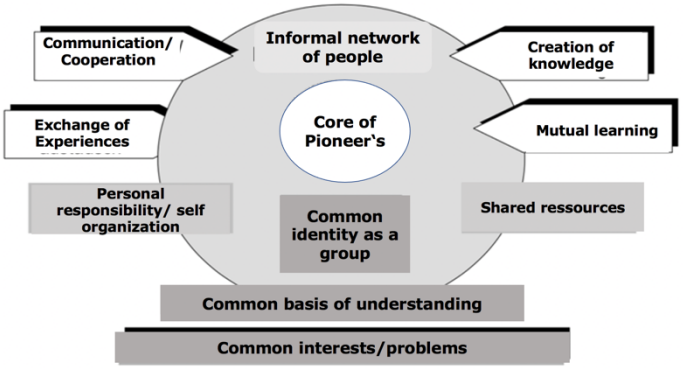


Figure 43 *INFORMAL LEARNING NETWORK OF PEOPLE Source REINMANN-ROTHMEIER G. (2000)*

The possibility of interactive learning and knowledge management with e.g. the use of personal learning networks was hardly mentioned by the respondents: 22% had used online learning groups with colleagues/SPs in professionally relevant problem situations. 5% had used an individual online network *(*TABLE *53)*.

Based on her studies, REINMANN-ROTHMEIER (2000) concluded that learning communities "*will increasingly form the nucleus for knowledge management-relevant processes in connection with individual and organizational learning processes and can thus have important cultural and identity-forming effects*." (REINMANN-ROTHMEIER 2000, S.5, free translation)

Accordingly, learning communities represent a useful method for SPs to exchange ideas about DT in their professional practice and thus to develop an adapted professional culture with integrated remote work (see *good practice example from the UK*). On the occasion of the commemorative event "100 years of School Psychology in Germany" in 2022, the futurologist PETER SPIEGEL gave an outline of "*Future skills in school psychology*". He explained that collaborative skills based on whole-system oriented values and attitudes are the crucial elixir of the digital age and that SPs play an important role in teaching these skills.

9.3.6.2.5. DIGITAL TECHNOLOGY COMPETENCE

Digital technology competence, which included in the DigComp areas of 'safety and problem solving', has particularly affected school psychology since the revision of the DigComp (VUORIKARI et al. 2022). The topic of psychosocial health was added to the competence framework. E.g., "*Problem Solving - Knowledge: Knowledge of technical practices to*

improve inclusion and access to digital content and services, such as tools like magnifier or text-to-voice function." (VUORIKARI et al. 2022, p.46)

Digital technology competence was addressed in the DiCoSP questionnaire by the following ITEMs:

TABLE 54 *Percentage response frequency to ITEMs analyzing digital technology competence*

ITEM	**Digital technology competence in school psychology practice (TK)- safety N=181.**	**Percentage assessment as important (very/very much)**	**Percentage self - rated assessment as competent (very /somewhat)**	**Difference in percent between both assessments**
G2Q00003 SQ014	I pay attention to my digital well-being	96%	87%	9%
G2Q00003 SQ004	I consider risks and dangers in digital environments in my professional practice	90%	67%	23%
G2Q00003SQ021	I am able to help schools prevent cyberbullying	84%	44%	40%
G2Q00003SQ019	I can promote the competence of students to protect themselves in the digital space	73%	43%	30%
G2Q00003SQ022	I know professional and legal standards to ensure the quality of my digital services	79%	38%	41%
G2Q00003 SQ012	I advocate for children's rights in the digital space	59%	25%	34%
SECURITY		**80%**	**51%**	**29%**
ITEM	**Digital media competence in school psychology practice (TK) N=181 - problem solving**	**Percentage assessment as important (very/very much)**	**Percentage self - rated assessment as competent (very /somewhat)**	**Difference in percent between both assessments**
G2Q00003 SQ013	I know technical solutions to protect confidentiality in digital consultations	81%	39%	42%
G2Q00003 SQ016	I reflect on my digital practice and develop it further	82%	56%	26%
G2Q00003SQ023	I understand the impact of digitization on SP practice	87%	67%	20%
G2Q00003SQ024	I can systematically evaluate my digital applications	59%	29%	30%
G2Q00003 SQ015	I can use assistive resources to enable digital participation of students with disabilities.	54%	15%	39%
PROBLEM SOLUTION		**73%**	**41%**	**28%**
TOTAL		**77%**	**46%**	**31%**

At least three-quarters of respondents considered technology competence to be important in their professional practice, and about half of them felt competent in this area (TABLE 54).

96% of the respondents considered paying attention to their own digital well-being in their professional practice to be important and 87% felt being able to do so (personal competence in the DiCoSP - model). More than half of the respondents engaged constructively with DT in their professional practice. 67% understood what DT meant in their professional practice and 56% reflected on and developed their remote working. It could therefore be assumed that around half to two third of the respondents had **media reflective competence** as defined by WENZEL (2015). As already addressed in chapter 9.3.6.1.3., this result indicated that media reflection still represented a challenge for SP - with 44% not feeling competent - because it is an indispensable prerequisite for self-organized ability to act professionally.

In almost all responses on digital technology competence, there was a considerable discrepancy of 20%-40% between the assessment of the importance of DC and the assessment of one's own competence. The large gap raised professional policy considerations on how to overcome this discrepancy. In view of professional standards, it needed to be critically analyzed if

- 82% of the respondents considered the reflection on and development of their remote work as important, but only 56% considered themselves competent to do so.
- 59% of respondents considered the evaluation of their remote work practices as important and only 29% considered themselves to be competent to do so.
- 59% of respondents considered it as important to advocate for children's rights in the digital space (NASTASI et al. 2020) and only 25% of respondents considered themselves competent to do so.

For example, EFPA's Ethical Meta-Code provided for psychologists in practice a *"commitment to practice within the limits of competences acquired through education, training, and professional experience"* and *a "commitment to use new methods with caution, recognizing that new approaches and fields of application will continually emerge and that this represents a positive development."* These ethical principles are particularly relevant in relation to the digital transformation of school psychology practice. Considering the DiCoSP - results with high discrepancies between DC importance and self-assessed DC, it is necessary to find a professional policy response on how to manage this discrepancy between application of new methods and respect of one's own competence boundaries. Contributions from the focus groups and the

open questions of the online questionnaire mentioned as possible solutions:

- Specialization in the profession, such as SP for online counseling.
- Establishment of digital supervision groups to strengthen professional competence and exchange good practice of remote working methods.
- Establish a 'buddy system' in person of a SP per team who has expertise in digital-related ways of working, or a person who provides technical support in a team.

Another solution to strive for was also to develop a guide for digital-related school psychology practice, such as the EFPA guide 2020 *"Digital psychological interventions, recommendations for policy & practice."*

9.3.7. COMPETENCE MODELS IN COMPARISON

The survey data were matched with the competence models **DigComp, ISPA/CANMED Seven Roles Model, adapted Code Competence Atlas and DiCoSP - Digital Competence Framework,** allowing for a comparison of the models (APPENDIX 20). The DiCoSP - digital competence framework represented an integration of the other three models. The results (Figure 44) showed that the assessment of the DC importance ranged in all models between 73%-80%, the assessment of one's own competence between 55% and 64%. These were comparable sizes with minor specific variations. It was found that at least three quarters of the respondents considered DC as being important for their professional practice. Half of the respondents considered themselves to be competent about KAS. In all models there was a significant discrepancy of 16% on average between the assessment of DC importance and the self – rated own DC. Due to the KAS structure of the DiCoSP framework, it could be determined that this discrepancy was primarily at the expense of the **DC knowledge**.

FIGURE 44 *Competence Models for the school psychological practice in comparison*

DiCOSP DIGITAL COMPETENCE FRAMEWORK FMSS/KAS OF SCHOOL PSYCHOLOGY PRACTICE N = 181	% IMPORTANT	% COMPETENT	% DIFFFERENCE
	Professional Competence		
Knowledge	79%	49%	30%
Skills	76%	54%	22%
Attitudes	86%	76%	10%
Mean	80%	60%	20%
	Methodological Competence		
Knowledge	82%	49%	33%
Skills	63%	49%	16%
Attitudes	74%	68%	6%
Mean	73%	55%	18%
	Social Competence		
Knowledge	71%	28%	43%
Skills	82%	71%	11%
Attitudes	77%	56%	21%
Mean	77%	52%	25%
	Personal Competence		
Knowledge.			
Skills	89%	79%	10%
Attitudes	92%	88%	4%
Mean	90%	83%	7%
AVERAGE	80%	62%	18%

DIGKOMP	% IMPORTANT	% COMPETENT	% DIFFERENCE
IDC	82%	72%	10%
CC	73%	60%	13%
EDICREA/MEC	55%	36%	19%
SECURITY	82%	59%	23%
PROBLEM SOLVING	75%	48%	27%
MEAN	**73%**	**55%**	**18%**

CLASSIFICATION OF THE BASICS OF DIGITAL COMPETENCE IN THE PROFESSIONAL 7-ROLE-MODEL ISPA/CANMED	% Important	% Competent	DIFF	% Frequent + Occasional
Communicator	85%	83%	2%	84%
Organizer	82%	75%	7%	89%
Professional	88%	69%	19%	91%
Scientific practitioner	71%	54%	17%	65%
Team player	72%	52%	20%	90%
Advocate Mental Health	63%	44%	19%	57%
Expert	64%	37%	27%	66%
Average	**75%**	**59%**	**16%**	**77%**

COMPETENCE CLASSES ADAPTED TO CODE COMPETENCEATLAS	% Important	% Competent
Professional and Methodological competence	76%	57%
Social-communicative competence	70%	57%
Personal competence	88%	77%
Mean	77%	64%

The results of the DigComp model corresponded to the results of the methodological competence in the DiCoSP - model, as in both areas the focus was on professional DC. The results of the CODE®-CompetenceAtlas (Figure 45) corresponded to the results of technological and methodological competence as well as personal competence in the DiCoSP model.

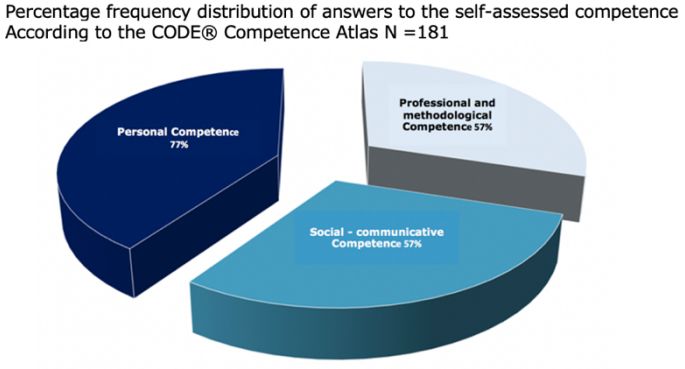


FIGURE 45 *Assignment of DiCoSP item answers to self-assessed competence in CODE® Competence Atlas*

The results for social competence differed more because the DiCoSP model focused on digitally related social competence compared to the general social competence of the CODE®-CompetenceAtlas.

Since the DiCoSP survey did not include any questions on knowledge of digital-related personal competence, it was not possible to compare the mean value with other competence classes and the Code competence class 'personal competence'.

A comparison of response frequencies between professional roles and DiCoSP - competence classes suggested that results of the DiCoSP - **social competence showed the most** correspondence to the role of a **team player,** while **technical competence** showed most correspondence to the role of a **professional,** and digital-related **methodological competence** showed most correspondence to the role of a **scientific practitioner.**

TABLE 55*: Percentage frequency distribution of responses to self-assessed DC assigned to the ISPA/CANMED SEVEN ROLES MODEL*

Seven Roles Model	% Important	% Competent	DiCoSP Competence Framework	% Important	% Competent
Communicator	85%	83%	Social competence	77%	52%
Organizer	82%	75%	Professional competence	80%	60%
Teamplayer	72%	52%	Social competence	77%	52%
Professional	88%	69%	Professional competence	80%	60%
Expert	64%	37%	Methodological competence	73%	55%
Scientific Practitioner	71%	54%	Methodological competence	73%	54%
Mental Health Advocate	63%	44%			

Matching the DiCoSP ITEMs with the ISPA/CANMED seven-role occupational model (TABLE 55) led to the finding that the respondents rated DC as **most important** in the role of a **professional** followed by the role of a **communicator** and then the role of an **organizer.** DC was considered to be **least important in the role of a mental health advocate.** This role distribution corresponded with the results of use of digital resources in school psychological work fields. Most respondents used digital resources in collegial collaboration, communication with target groups/individuals, counseling, administration, and report writing (90% - 95%). The fewest respondents used digital resources in the areas of treatment/therapy, learning support, crisis intervention and health promotion (48% -59%).

Most respondents considered themselves to be **digitally competent** in the **role of a communicator** and least competent in the role of a digital expert. The role of a digital expert showed the biggest difference between the assessment of DC importance and self – rated own competence (64%:37%) (TABLE 55).

The results of the professional role model corresponded in magnitude to the assignment of the DiCoSP results to the DigComp model, in which most respondents considered information and data competence to be important and also most often considered themselves competent in this area. In addition, it could be assumed that most SPs used digital technology in the classic sense as an instrument of information and communication and less as an instrument for shaping their own digital space, which above all requires media competence.

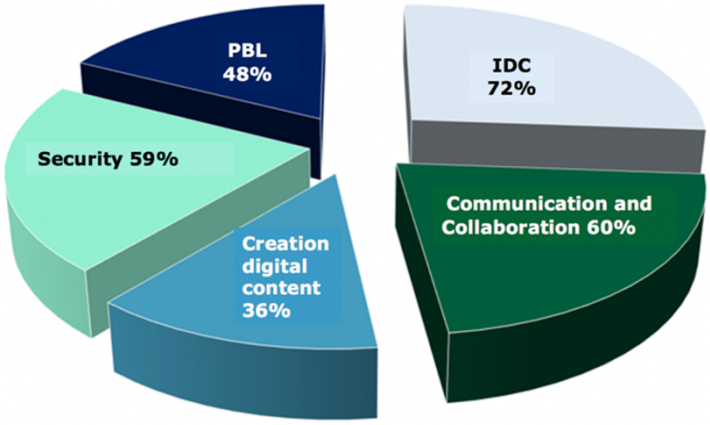


FIGURE 46: *Percentage frequency distribution of DiCoSP -ITEM responses ton self - assessed DC assigned to DigComp - model.*

48% of respondents felt competent in digital problem solving and 36% in media competence (Figure 46). Both areas required basic and advanced digital technical knowledge. It has already been pointed out that most respondents did not consider advanced DC to be relevant for their professional practice. Hence, there was a large discrepancy in professional digital competence between the appreciation of DC and one's own self – rated DC. This situation indicated the need of professional policy action in the interest of quality assurance of school psychology services.

The results show that each of the four competence models can provide useful information on DC. Which type of model should be applied depends on specific objectives.

The DICOSP model is suited for a general inventory of the basics of DC in the profession of school psychology and as a guide for needs of DC in professional practice. It is a useful model

- for education and training institutions to develop curricula and educational programs;

- for individual SPs or school psychology services as a compass for creating competence profiles as a basis for future professionalization measures;
- for research institutions to identify practitioners' needs for digital-related topics.

The ISPA Seven Roles Model is suitable for identifying necessary digital requirements in professional practice. It is easier to formulate necessary basics of DC based on concrete role requirements than to consider - as in the DiCoSP model - which basics are necessary to achieve a general digital social competence in school psychology practice. The Seven Roles Model is especially suitable for an analysis of a concrete work context and for considerations about professionalization in professional associations.

The European DigComp provided guidance especially when it came to measuring and developing professional DC, as it can distinguish different levels of competence. This was not intended and is not possible with the digital DiCoSP framework. The DigComp could provide an answer when specifically asking for an assessment of data and information, communication, media, and technology competence in the work context or in an educational and training context. For example, the DigComp can be usefully employed if the question of knowledge management of SP is specifically addressed. Or, it can contribute with a measurement of media and communication competence if the training of SPs in communication skills for presenting school psychology issues to the public is of interest. In such contexts, the DigComp can provide a competence measurement at multiple levels.

The CODE®-CompetenceAtlas was a tool for the labor market and enabled considerations on important skills for the digital age. It did not aim specifically at DC, but broadened the view of important prerequisites for being able to work competently under the conditions of DT. In this respect, it was an interesting instrument for the concrete work context for taking stock of inter-professional and interdisciplinary competence as a means of promoting DC of SPs.

The DiCoSP digital competence framework for school psychology practice allows for the integration of the Seven Roles Model, the Code Competence Atlas, and the DigComp Model. It is more comprehensive than the other three models, more profession-specific than the DigComp and Code Models, more specialized in DT processes than the Seven Roles Model and the Code Model.

This integration ability required a structure of general dimensions (PMSP, KAS) at the expense of precision. Some competence basics

cannot be precisely matched but fit into several competence classes. There is so far no theoretical basis for the impact of combinations of basics on desired DC in practice. The advantage of the integration capability of the DiCoSP - model is that

- especially against the backdrop of the fast pace of digital transformation, it is easy to add new, necessary basics of DC or to remove basics that have become outdated;
- specific basic patterns of DC can be modularly rearranged according to interests and needs.

9.3.8. THE DIGITAL WORKPLACE OF SCHOOL PSYCHOLOGISTS

Since VENKATESH et al. (2003) identified facilitating conditions, such as organizational and technical infrastructure, as one of the four decisive variables for the acceptance and application of technologies within the framework of the UTAUT theory, this aspect was examined in more detail in the DiCoSP study. According to the FRANKE model (FRANKE 2005, Figure 7), workplace conditions were determinants of the acquisition of skills. These will be presented here to be able to assess how they contribute to determining the acquisition of digital skills among SPs in the four countries studied.

9.3.8.1. ADAPTING THE WORKPLACE TO DIGITAL TRANSFORMATION

G6Q00001 To what extent has your work environment adapted to the digital transformation(strategy, working methods, infrastructure)? N=172v	% AT N=26	% BE N=12	% CH N=36	% DE N=98	% Σ
Full and complete (AO01)	0%	0%	8%	6%	5%
Quite (AO02)	46%	100%	64%	58%	61%
Full and quite	**46%**	**100%**	**72%**	**64%**	**66%**
Barely (AO03)	39%	0%	22%	35%	30%
Not at all (AO04)	15%	0%	6%	1%	4%
Barely and not at all	**54%**	**0%**	**28%**	**36%**	**34%**
Σ					

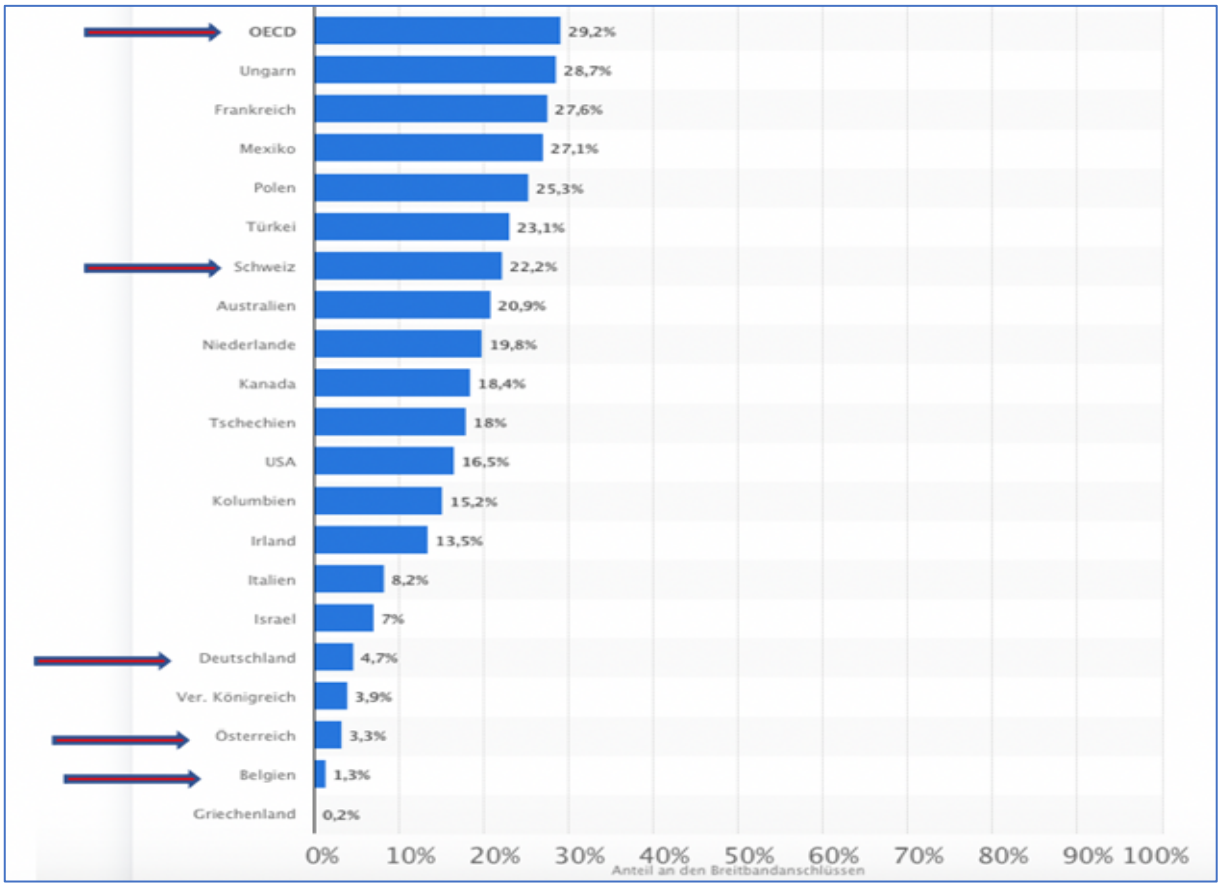
TABLE 56 *Percentage frequency of responses to ITEM G6Q00001 on the adaptation of school psychological services to digital transformation*

Two-thirds of the DiCoSP questionnaire respondents estimated that their working environment has largely adapted to digital change, around one-third observed little or no digital adaptation (TABLE 56). While Belgian (100%) and Swiss (72%) respondents were most to observe the adaptation of their service to DT, they were followed by 64% of German and 46% of Austrian respondents (TABLE 56).

9.3.8.2. DIGITAL INFRASTRUCTURE

The STATISTA publication (Figure 47) on the share of fiber optic connections in all stationary broadband connections in 2020 showed how low the connectivity in DE, AT and BE is in terms of fast connections, in contrast to CH and the average of the OECD countries. In international terms, there was a clear need to catch up. Compared with other countries, DE and AT had a relatively high proportion of slow DSL copper cable connections. CH was among the leaders in Europe in terms of both the

Figure 47: *STATISTA - Publication 2020 Proportion of fiber optic connections to all broadband connections in oecd countries*
https://de.statista.com/statistik/daten/studie/415799/umfrage/anteil-von-glasfaseranschluessen-an-allen-breitbandanschluessen-in-oecd-staaten/



Internet connection rate and the proportion of broadband connections. The CH had one of the highest broadband and mobile availability rates in Europe, which indicated a *high interest in investing in digital infrastructure*. To be able to assess the extent to which schools were equipped with digital infrastructure, the connection to the digital network was one side of the coin, while the other was the access of students and teachers to the Internet. The associated data were difficult to access.

A representative study of the University of Göttingen/DE (MUßMANN et al. 2021) found that around 70% of teachers had access to WLAN at their school, but hardly 50% of the students. According to a survey by the Austrian Ministry of Education (BUNDESMINISTERIUM FÜR BILDUNG, WISSENSCHAFT UND FORSCHUNG 2020b), 56.7% of middle schools, 61.3% of general secondary schools and 74.5% of vocational middle and secondary schools had WLAN in all classrooms and common rooms. According to a study by the Agence du numérique 2018, 75% of classrooms in East Belgium were connected to the Internet, with rural areas in East Belgium still barely having a high-capacity access network due to the significant pent-up demand for fiber rollout (MINISTERIUM DER DEUTSCHSPRACHIGEN GEMEINSCHAFT 2020). In Switzerland, nearly 80% of students had a WLAN connection in their school (BUNDESAMT FÜR STATISTIK 2020).

Due to this initial situation of digital infrastructure, it was expected that

a) in BE, DE and AT, digital work with schools was more difficult than in CH;
b) in rural regions of BE, DE, and AT, digital work with schools was more difficult than in urban regions;
c) SPs in CH could use digital resources more extensively in their practice than SPs in the other states due to better connectivity;
d) SP could not perform elaborate digital applications, such as video streaming or similar, in BE, DE and AT in a timely manner due to insufficient connectivity.

The DiCoSP results of ITEM G6Q00002 *(Please rate the digital equipment of your workplace (very poor- somewhat poor- neutral- rather good - very good)* reflected this picture of digital infrastructure as a prerequisite for remote work of SPs with the following characteristics by the following characteristics: hardware and software equipment, maintenance and care of IT equipment, availability of PC workstations, availability of specific software (e.g. licenses for electronic tests), user advice and support, WLAN connection at the workplace and in schools (TABLE 57).

Around half of the respondents (N=181) found themselves confronted with inadequate digital infrastructure in the form of poor **connectivity** (WLAN connection) both at the **workplace (**53%) and in **schools** (49%) as well as inadequate **equipment with specific software** (47%). While most respondents had good to very **good equipment** at their workplace (hardware and software equipment, availability via PC workstations, IT - maintenance and care), about one third each found the IT support of school psychology staff to be poor (33%), neither good nor poor (28%) or good to very good (39%). Given the SP's limited time availability, personal IT support at the workplace could thus contribute to promoting DC in at least one third of the SPs.

ITEM G6Q00002 PERCENTAGE OF RESPONSES TO DIGITAL WORKPLACE EQUIPMENT										
Assessment of digital workplace equipment N=173v	AT		BE		CH		DE		% = Σ	% = Σ
	Well equipped	Poorly equipped	Well equipped	Poorly equipped	Well equipped	Poorly equipped	Well equipped	Poorly equipped	Well equipped	Poorly equipped
Equipment with hardware and software	55%	34%	84%	8%	62%	22%	58%	24%	60%	23%
Availability of PC work Stations	62%	8%	84%	0%	76%	13%	87%	6%	79%	8%
Specific software	23%	62%	0%	58%	54%	35%	32%	49%	34%	47%
Support of staff for remote work	15%	55%	26%	58%	57%	30%	40%	25%	39%	33%
WLAN at work	11%	81%	84%	16%	60%	35%	31%	58%	39%	53%
WLAN in schools	19%	42%	50%	42%	43%	30%	8%	58%	21%	49%

TABLE 57 *Percentage response frequency on ITEM G6Q00002 Infrastructure of SP's workplaces*

Poor workplace equipment was most frequently reported by Austrian respondents: **81% reporting deficient WLAN connection at the workplace**, 62% deficient specific software equipment and 55% deficient IT support. In a country comparison, Swiss respondents most often noted good IT - equipment on average for all equipment features, followed by Belgian respondents. 84% of Belgian respondents noted good equipment and connectivity in the workplace, but 58% reported deficient specific software equipment and 42% deficient connectivity in schools and in IT support. 35% of Swiss respondents criticized connectivity in the workplace as well as specific software equipment. 58% of the German respondents criticized the deficient connectivity at the workplace and in schools, and 50% also criticized the deficient specific software equipment.

In chapter 9.3.5.4.1. it was already mentioned that

- Specific software, like electronic tests, were cost intensive and represented a barrier for remote work for nearly 50% of the respondents given restricted budgets of school psychological services. Comments from the DiCoSP questionnaire confirmed this assumption *"I see the challenge in using digital resources in the authority's unwillingness to allocate budget funds for the purchase of software that is suitable for content and subject matter (e.g. a suitable video conferencing system for conducting digital training courses)."*

  "There are many free digital offers that have a big deficit in data security, which is very important especially in our field. I think that the rather low interest of psychologists in technology and digital things means that not enough attention is paid to this, even at

management level, and therefore programs such as Zoom, Dropbox, etc. are often used for reasons of cost, instead of purchasing secure but paid programs.

- deficient WLAN – connections in schools as most important partner of SPs represented a significant problem of remote work. 30% of Swiss respondents saw a problem in this regard, 42% of the Austrian and Belgian respondents and mostly 58% of German respondents. (Figure 37, Study HUBER et al. 2020 on digital capacities of schools in AT CH, DE) A comment in the DiCoSP survey supported the analysis: *"Most of the school infrastructure is barely working, e.g. it is impossible for us to do more than 2 or 3 simultaneous video conferences in the school building because of the limited internet connection, nevermind the lack of camera or audio equipment."*

That these requirements were relevant for remote work of SPs was shown, among other things, by the fact that

- 43% of the respondents saw improved technical infrastructure as a driver of digital change in school psychology (TABLE 29).
- 36% of respondents found "infrastructure and management" to be a particular challenge in remote work" (TABLE 61).

9.3.8.3. WORKING CONDITIONS

In the context of GENNER's digital competence model, the importance of values and norms as well as the regulatory gap in SP's remote work have already been pointed out. In none of the countries studied was a nationwide binding regulation for SP on remote work practices, so that data protection in school psychology was largely subject to general data protection law. Important issues were professional secrecy, locations of data storage, management of access rights to data, deletion concepts, automated anonymization, etc. Legal regulations for remote work in school psychology were thus still in their infancy in the German-speaking European countries.

This was also reflected in the digital-related knowledge of the respondents. As professional conduct with integrity and the protection of personal data (EFPA ETHICAL META- CODE) are highly valued in (school) psychology, a large majority of respondents found it important to consider digital risks in their practice (90%), to know of technical solutions to protect confidentiality in counseling situations (81%), and to know of legal and professional standards to ensure quality of digital services (79%) (TABLE 58). However, in the compilation of the DiCoSP - questions on knowledge of the legal situation in connection with digitally related work, a large gap emerged between the assessed importance of knowledge and SP's own DC:

TABLE 58 *Percentage of responses to ITEM G2Q00003 on professional digital skills*

ITEM N=181	QUESTION	Assessment of the importance in professional practice	Self-assessment as competent	Difference
G2Q00003 SQ020	I know what information about students may be stored	83%	44%	39%
G2Q00003 SQ022	I know professional and legal standards to ensure the quality of my digital services	79%	38%	41%
G2Q00003 SQ010	I know about copyrights and licenses	71%	28%	42%
G2Q00003 SQ012	I advocate for children's rights in the digital space	59%	25%	34%

On average, the difference between the two assessments was around 40%. This discrepancy indicated a need for action to convey this competence to provide SPs with legal security in the workplace as an important prerequisite for remote work.

The responses on the selection of topics for continued professional development underpinned the importance of the "working conditions" as a factor for DC acquisition. Around one third of respondents indicated interest in further training on labor law issues. 35% selected "Guidelines of remote work in school psychology" and 34% "Digital dilemma situations in practice" as a topic (TABLE 59).

TABLE 59 *Percentage of response frequencies on ITEM G2Q00006 Selection of topics for continued professional development*

G3Q00006 If you could choose from the following continuing education offerings, would you choose? N=181v	
Reply	**%**
Digital related topics	
Relationship building in online counseling (SQ009)	52%
Opportunities and risks of digitalization for children and young people/familie (SQ017)	38%
Guidelines of remote work in school psychology (SQ012).	35%
Digital dilemma situations in school psychology practice (SQ010).	34%
Knowledge of digital tools (SQ015)	29%
Digital Theories of Learning, Teaching, and Behavior (SQ014).	29%
Management of professional digital information (SQ016).	19%
Data protection legislation (SQ004)	18%
Not digital related topics	
Crisis intervention in times of pandemics (SQ003)	59%
Prevention of school absenteism (SQ005)	52%
Emotion regulation in elementary school (SQ001)	48%
Strengthening Resilience in Secondary Schools (SQ008).	47%
Helping parents cope with the time of school lockdown (SQ007).	39%
Promotion of health in the teaching profession (SQ011)	31%
Mental Health of Adolescent Migrants (SQ006)	25%

Intelligence assessments with the KABC-II (SQ002)	11%
Other	4%

NEWMAN et al. (2019) pointed out the empowering impact of value orientation and legal security for SPs in DT: *„When arriving at the intersection of technology, ethics and the law in school psychology training and practice, school psychologists are advised to proceed with caution. The numerous benefits of the proliferation of technology in school psychology, including increased access to services and efficiency of practice. Yet there are also challenges with navigating ethical terrain, particularly related to confidentiality, professional relationships, and behavior. Fortunately, professional guidelines and legal mandates provide roadmaps to support school psychologists in successfully traversing murky pathways. When school psychologists develop competency in the ethics of technology usage, in addition to the technologies themselves, they can more confidently forge full steam ahead into contemporary practice."* (NEWMAN et al. 2019, p.258)

Most respondents saw the working conditions as a barrier to remote work: infrastructural framework conditions (41%), lack of working time (19%), unclear service regulations (21%), data protection concerns (22%) and lack of management support (12%) (TABLE 60).

TABLE 60 *Percentage of responses on barriers of remote work*

G4Q00001 What are the stumbling blocks for you in your usage. digital tools? N=184, multiple answers possible	**Percentage of responses**
With lack the appropriate framework (infrastructure, equipment) (SQ008)	41%
I can relate to the use of media, but my priorities are elsewhere (SQ003)	32%
None, the use of digital media is an integral part of my work (SQ001)	31%
I lack the technical know-how (SQ007)	25%
I have concerns for privacy reasons (SQ006)	22%
The legal situation is unclear for SP (SQ015).	21%
My working time is not enough for this (SQ011)	19%
I would like to use more media, but don't trust myself to do it alone (SQ004)	13%
My superiors do not strategically support digital media use (SQ012)	12%
There is no interest from my target group (SQ005)	6%
I don't want to enter a field of work that overwhelms me with its fast pace and complexity (SQ009)	6%
Someone else in my service is responsible for digital media outreach (SQ014)	6%
Digital work is socially unjust (SQ010)	4%
Other	4%
The use of media does not provide added value (SQ002)	3%

The 138 comments to two open questions (TABLE 61) were also mainly related with 36% to a deficient infrastructure and a lack of management responsibility.

Evaluated topics of open answers	%	Comments
Infrastructure and management	**36**	Lack of equipment, deficient assumption of management responsibility
Overload	**15**	Complexity, frustration tolerance, time pressure, finding a balance...
Relationship in digital environments	**14**	Difficult to design online
Competences and training	**11**	Different competences in the team stressful
Privacy	**10**	Security, confidentiality
Digital divide	**5**	Technical equipment, competence
Evaluation of the questionnaire	**4**	
Other	**3**	
Health aspects	**2**	
Assessment of survey	**4**	

TABLE 61 *Evaluation of the responses to the open questions G2Q00007 Challenges in digital work and G3Q00009 - general comment*

The responses reflected a dilemma in school psychology practice between the pressure to adapt and the lack of decision-making. Deficient digital infrastructure resulted in search for legal security on a marshalling yard of responsibilities and also in a feeling of powerlessness due to missing room to maneuver. The following comments illustrated professional adaptation problems to digital change:

"As a psychologist, confidentiality must be paramount and open-source, privacy-friendly and data-saving software must be used accordingly. However, I often experience a very great willingness to invest in data-hungry solutions because there is a lack of IT competence in the country and you "need someone to sue" in the event of a data protection case. This is toxic for psychologists, especially when digital competence stays with software utility. Digital competence is also all about the possibilities that technology provides. This is consistently avoided in all projects and trainings. I see it as the task of psychologists to insist on their own professional foundations, because there are solutions that ensure confidentiality and data protection - in communication, in data storage, in confidential documents, everywhere!"

"The biggest problem is that the superior authority is completely ignorant of the requirements of a technical infrastructure for school psychology. Inquiries, suggestions, and demands are ignored and simply not processed. The superior authority is of the opinion that online counseling, online supervision, and online training are all perfectly possible via Skype for Business since this is technically possible on a state-owned server. Data protection concerns and the unsuitability as a tool for continuing education or supervision are brusquely ignored."

"Also, change would need to happen across all levels especially in the use of digital capabilities in improving communication, knowledge management and collaboration! Right now, a lot is expected of us SPs at the grassroot level, but little change in the way we work from top down."

"Many aspects are hierarchical / centrally regulated, such as design of a homepage."

"The superior authority prevents us from using digital tools. We are threatened with personal accountability, prohibiting us from offering online platforms for counseling. The infrastructure for stable Internet connections is not available, forcing most of us to work from home instead of the office."

"*I and colleagues would be willing and motivated to use digital resources to improve and expand our school psychology work, but this is institutionally made impossible. In the Ministry of Culture, there is no one as a contact person for school psychology with professional and personal competence in this regard."*

The complex challenges of digital change had also caused some uncertainty at the management level of school psychological services, especially at the time of the COVID-19 pandemic, so that this level also needed professional support in developing a remote way of working. As an example from the DICOSP questionnaire, one SP in a senior position commented *"For me, a big challenge is to find the right balance between digitalization and "classic ways of working" so as not to overwhelm staff, while also ensuring data security."*

Al-Baba (2022) found similar comments in her study on remote work of British SPs:

"Senior leadership impacts the frequency of IT use, availability of up-to-date devices, IT usage policies, availability of IT-mediated assessments, and time allocated to explore IT and develop competence. Planning by senior leadership was often related to comfort levels with IT." (p.6) "EPs reported that senior leadership was a barrier to utilizing IT in their practice. EPs felt that this was due to IT not being prioritized and the focus instead being on fulfilling statutory duties that were essential for the services to survive .... Senior leadership views added another barrier when, according to EPs, they were "inflexible", "rigid", and "skeptical". ...Another subtheme identified ... that IT planning was not strategic .... IT was seen as an "add-on" driven by being "cost-effective" instead of functional." (AL BABA 2022, p.110)

ALBRECHT & AMMERMÜLLER (2016) summarized the need for the future development remote practice in the labor world: *"In the future, it will be less a matter of technological innovation than of its meaningful applications. The ... establishment of digital platforms in the service sector...and Big Data applications are already possible but have by no means reached the added value to become widespread...Those who do not examine and adapt their business models and open new business areas run the risk of being overrun by developments. Above all, high-quality products with new, customer-oriented services offer new perspectives (Big Data, digital platforms as a link between producers and customers). Flexible and mobile forms of work must be used to the mutual benefit of companies and employees. Job profiles and training content must be adapted to new activities in a timely manner...Institutions must ensure continuous evaluation and further development as well as integrate new*

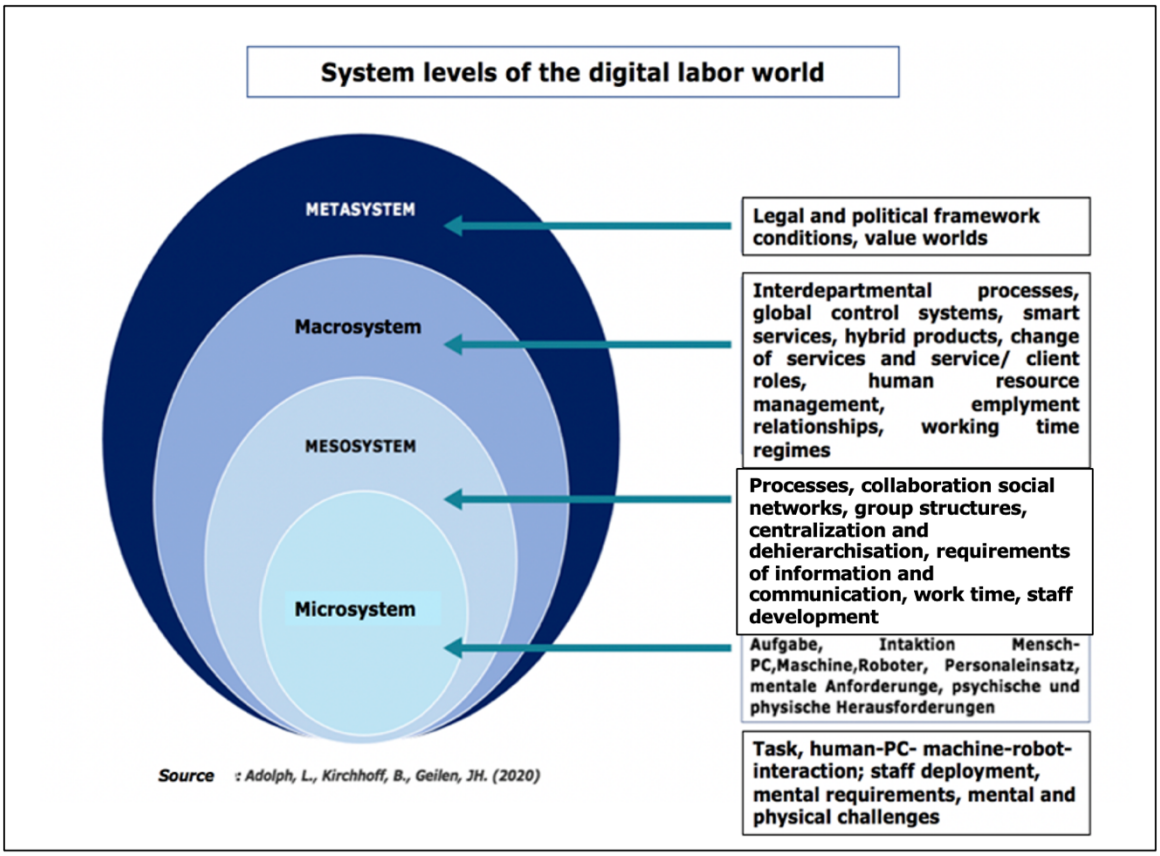
digital learning approaches." (ALBRECHT & AMMERMÜLLER 2016, p.41, free translation)

Contributions in the expert focus groups underlined this conclusion:

"When we met about the topic of DT of school psychology [...], very different people came together and had completely different ideas about what it actually was about and how school psychology should develop and how schools should develop and in which areas ." […] We were then able to summarize this in a report by saying that it is first about developing an attitude. This means that we must ask ourselves where we actually want to go and where not. […] You actually need "attitude stops" where you say, yes, I'm willing to go there as it makes sense and that's where I don't want to go […] and actually we would have to think about such an attitude in every area of work […]."

"[…] what I noticed in the work […]: For compensation for disadvantages in the case of behavioral problems, psychological disorders and anxiety disorders the lockdown was the best thing that could have happened... Some of the children coped much better with hybrid in the small groups and we suddenly saw children who had blossomed, even though they had a need for social-emotional support, or even very shy children who suddenly showed themselves because the others weren't massively there [...] We got a lot of information which we can use for individual case work or for further teacher's training. Compensating for disadvantages from the presence to the digital, from the digital to the presence – I think that's wonderful."

FIGURE 48 *System levels of the digital world of work Source: ADOLPH et.al. 2020*



DT is a complex challenge for school psychological services because it requires multi professional and transdisciplinary collaboration. It requires the cooperative integration of technical as well as informational, legal, and (school) psychological competence (MAIER et al. 2020). From a systemic point of view, the results indicated a need for standardization at the macro and meta levels of school psychology work, so that adaptation processes at the meso and micro levels would then be easier to implement (Figure 48). WENZEL (2015) illustrated this process for remote counseling work:

"The integration of electronic media into everyday counseling is a very complex process, which takes place in such a way that interested and curious counselors usually lead the way in working with new media and others follow later, if this is encouraged by the management. At the organizational level, the greatest challenges are to ensure that the professionals are media-reflective and that they have adequate technical equipment. With regard to the funding and responsibility of counseling via electronic media, however, there is also a need for processing at the association level and the political level." (WENZEL 2015, p.48, free translation)

Against the background of the uncertain labor law situation of the SP, a revision and updating of ethical frameworks as well as an establishment of data protection law solutions in the remote work of the SP seemed and seems to be a necessary way to cope with professional problems caused by DT. A coordinated effort is needed to develop guidelines for a digitally related school psychological practice and a digitally competent school psychology organization, e.g., in the form of legal and ethical decision-making models (WILLIAMS & ARMISTEAD 2010). This is not only an individual task, a task for educational psychology, but above all a challenge for professional and employer organizations. Without such a basic frame of reference, the development of DC and remote work in school psychology will hardly be accomplished.

9.3.8.4. DIGITAL COMPETENCE AQUISITION

The digital competence acquisition process was addressed by the following questions :

- *G3Q00001Where did you acquire digital skills and to what extent?*
- *G3Q00005 Which of the digital competence training formats do you have used and found helpful in your professional practice?*
- *G3Q00003SQ003 Which factors influence your use of digital competence training? Possiblity of response: I have no need for digital competence development.*

G3Q00001 *Where did you acquire digital skills and to what extent? N=181*	% = Most or All
School	8%
University	28%
Continued training	18%
Workplace	63%
Private environment	62%
Self regulated learning	66%

TABLE 62 *Percentage frequency of responses to ITEM G3Q00001 Where was DC acquired?*

The surveyed SPs acquired their DC mainly through self-directed informal learning (66%), with the help of their private environment (62%) and at work (63%). 18% acquired all/most through continued training (TABLE 62). Schools played hardly any role in the acquisition of DC. Around one-third of respondents acquired all/most of their DC at university.

The annual German D21 Digital Index (SCHMID et al. 2018) provided information on how citizens have acquired knowledge about computers, the Internet, and digital topics. 82% acquired knowledge through informal learning, 69% are self-directed with the help of the Internet, 65% got help from friends, family, and colleagues. 28% took advantage of formal learning opportunities, such as training courses on the Internet, training offers by employers, self - financed trainings. The surveyed SPs were thus in line with the general population's trend of acquiring DC. It could be assumed that informal, self-directed learning is the most common learning format in the acquisition of digital skills compared to formal education.

The DICOSP results were consistent with the findings of VAN DEURSEN's (2014) study on digital skills acquisition:

"Facer, Furlong, Furlong, and Sutherland (2001), for example, showed that ICT skills are mainly acquired informally in homes rather than through formal education in schools, and Katz and Aspden (1997) found that most people learned how to use the Internet from family, friends, and colleagues. The workplace is a frequently reported location for learning to use computers (Selwyn, Gorard & Furlong, 2006). We consider the assistance of colleagues as a somewhat formal way of finding help, as the workplace is a more stringent professional environment that does not allow extended degrees of freedom in time or task completion."(VAN DEURSEN et al. 2014, p.8)

20% of the DiCoSP - respondents felt that training opportunities had promoted remote work, which was roughly in line with the percentage of respondents who said they had learnt most or all through training courses (TABLE 63).

ITEM G6Q00004 *Which online or offline training opportunities are available to you if you want to improve your digital skills*?	**% Answers**
At Workplace	57%
Superior authority for SPs only	38%
Private providers	35%
Professional organization/specialized societies	25%
Superior authority for multiprofessional groups	24%
Universities	16%
Continuing education with licensing DC	12%

TABLE 63
Percentage response frequencies to ITEM G6Q00004 on access to training opportunities for SP on DC.

Training at work was most frequently offered (57%) to SPs, followed by offers exclusively for SPs from superior authorities (38%) and from private providers (35%). Around a quarter of the respondents (25%) were also aware of training courses offered by professional organizations/specialized societies and courses for multi-professional groups offered by superior authorities (24%). A small proportion of respondents were aware of continued training offers from colleges/universities (16%) and continued training offers with licensing (12%) (TABLE 63).

To get to know respondents' interest in DC acquisition, they were asked to indicate how many hours per school year they could devote to their own training, and how often they had participated in training to date. 8% did not like to invest time in training, while 92% of respondents were willing to spend time on DC training. Around two-thirds of respondents (61%) took part in trainings on DC topics during the last two years. **39% have not taken part in any DC related training during the last two years** (*ITEM G3Q00004).*

Barriers to DC acquisition N=181	**Percent of response**
Thematic conflict of interest (other topics more important in case of lack of time)	69%
Lack of time	65%
Lack of information (supply + own competence requirements)	63%
Shortage of training offerings	27%
Financial restrictions	15%

TABLE 64 *Percentage frequency of responses to barriers of participation in trainings on DC*

The most frequently cited barriers to participation in training on digital topics were: the limited time given by employers for further training, so that conflicts of interest arose between different offers. Furthermore, lack of time and also lack of information about offerings and about DC to be acquired was a hurdle for participation in further training (TABLE 64). Approximately 20% of respondents stated that they did not know what kind of DC they needed, so it could be assumed that there was uncertainty among at least one fifth of SPs as to what DC meant in their

professional practice. The presumed lack of training offerings as a barrier to the participation of SPs in training courses on DC played a role for around one third of the respondents.

SPs appreciated DC in their professional practice and they showed interest in continued training on DC, but it was a relative interest:

- 20% of respondents thought that training opportunities have helped to promote remote work for SP (*question G4Q00002*)
- 22% found it "uncomfortable not being digitally up to date" *(G4Q00002)*
- About one-third of respondents *(G4Q00001SQ003)* saw value in remote work, but considered other professional activities to be equally or more important
- 25% of respondents felt they lack technical expertise to work digitally (*G4Q00001 What stumbling blocks do you face in your use);*

The results on the uptake of training showed that **remote work was ONE topic among many other topics for SPs.** In comparison, SPILT et al. (2021) found in their study that only 11% of the Belgian SPs had taken up training on digital topics during a school year (before the start of the Covid-19 pandemic!) and only 9% indicated interest in such a training.

The AL-BABA (2022) study came to a similar conclusion:

„… participants in Surveys 1 and 2 reported that time to learn was the most significant time barrier to IT usage. In the interviews, the most significant barrier was the time to explore. EPs in the interviews reported that due to "very high workloads", there was not enough time or capacity to explore new IT and adapt to the new ways of working in response to COVID-19." AL-BABA 2022, p.100

If there is a limited amount of in-service training, then there is a conflict of interest as to which training topic should be given priority. Training topics must be prioritized. Presumably, the cited lack of working time (65%) exacerbated the thematic conflict of interest. SPs commented on the limitation of further training under service law*: "No right to further training", "Have already taken training courses this school year", "Approval or prioritization by superiors", "With a high professional load, additional time requirement to familiarize oneself with new digital formats."* (free translation)

If DC development was assessed by most SPs as less important compared to other topics and the time available for training was scarce, then **quick, informal, targeted solutions to professional challenges** were probably more likely to be sought. Comments from respondents illustrated this need: "*Independent learning fits best*", "*I would rather*

need situational and occasion-related on-the-job training", "*No need because I can learn what I need in my private environment*".

This hypothesis was supported by the results from the ITEMs '*G3Q00005 Which of the continuing education formats did you use to acquire digital competence and find helpful in your professional practice? and G3Q00001 Where did you acquire digital competence and to what extent?'* The four most common formats across all three digital competence levels were self-directed, informal learning formats (TABLE 65).

G3Q00005 Which of the DC training formats did you use and find helpful in your professional practice? N = 181	**Percent of responses**
Learning by doing at workplace (SQ008)	54%
Informal support from friends/family/colleagues with digital experience (SQ011)	42%
Online Tutorials (SQ004)	39%
Surfing the Internet (SQ001)	26%

TABLE 65 *Percentage of response frequencies on training formats used and perceived as helpful.*

A comparison of the DiCoSP study and the Bertelsmann study results (Schmid et al. 2018) on digital training of the German population allowed the classification of the learning patterns of the surveyed SPs (TABLE 66):

Helpful training formats	**DICOSP**	**BERTELSMANN**
Video Tutorial	39%	51%
Surfing the Internet	26%	91%
Webinar	23%	25%
E-books, PDF texts	21%	54%
Moodle learning platform	14%	14%
Learning in group meetings	13%	58%
Blended learning	12%	56%
Social media (Facebook, Twitter, Whatsapp..)	4%	31%
Self-learning program (games, simulation..)	5%	41%

TABELLE 66 *Percentage response frequencies on use of digital resources for own continued professional development in comparison to Bertelsmann study results*

In both studies digital formats were particularly valuated that allowed a maximum of freedom and independence in learning, such as video tutorials, e-books, or webinars. Interactive digital learning formats with social media, the use of learning platforms and game-based online learning were less popular for SPs. A typical comment from a DiCoSP respondent *"Provision of programs often takes time in administration, familiarization with programs is often done independently, helpful Youtube videos often have a supporting effect here."*

It could be concluded that SPs predominantly looked for informal ways for independent, fast, targeted professional problem solving. The goal seemed not to be primarily the acquisition of digital skills, but to learn how remote work can make professional life easier and more efficient.

This in turn supported the UTAUT theory in the found influencing factor 'performance and effort expectations' on the acceptance and application of technology.

The result on the frequency of using digital resources for one's own training (48% frequently, 37% occasionally TABLE 72) corresponded to the impression that dealing with the topic of DT was viewed from the aspect of usefulness. Around 6 times more respondents who saw DT as an enrichment for school psychology used digital resources in their own continued training than those who thought that DT did not bring about a change in school psychology or an impoverishment in areas of school psychology (TABLE 67).

ITEM G2Q00004SQ000 OWN TRAINING N=185	Frequent use of digital resources in OWN training.	Occasional use of digital resources in OWN ADVANCED EDUCATION.	Frequent and occasional use of digital resources in OWN CONTINUING EDUCATION.	No use of digital resources in OWN CONTINUING EDUCATION.
Stagnation/depletion of school psychology.	5%	9%	14%	2%
Enrichment of school psychology	43%	37%	80%	4%

TABLE 67 *Attitude toward the impact of DT on school psychology and use of digital resources for one's own training*

Although, given the interest in current topics, given the limited training opportunities within a service, and given the lack of time, making use of digital training formats (e.g., participating in webinars, in a learning - community, or building an individual network or following scholarly blogs) would be suggested, these opportunities were rather rarely used (TABLE 68).

SPILT's et al. study (2021, p.101) also concluded that SPs should use more academic blogs for training considering time constraints and service restrictions on the use of training. One reason of poor usage might have been that these formats were not yet sufficiently well known. There were indications in the DiCoSP questionnaire for a lack of information about training offers, in that

- 44% of respondents were not aware of any offerings (*G3Q0003* SQW006 *What factors influence your use of digital literacy training offerings?)*,
- about 59% of respondents considered the training offered to be poor or nonexistent *(G3Q00007*),
- 19% did not know which digital skills they should acquire *(G3Q0003 SQ002 I do not know what digital skills I need).*

TABLE 68 *Percentage response frequencies to ITEM G2Q00003 on participation in digital training formats.*

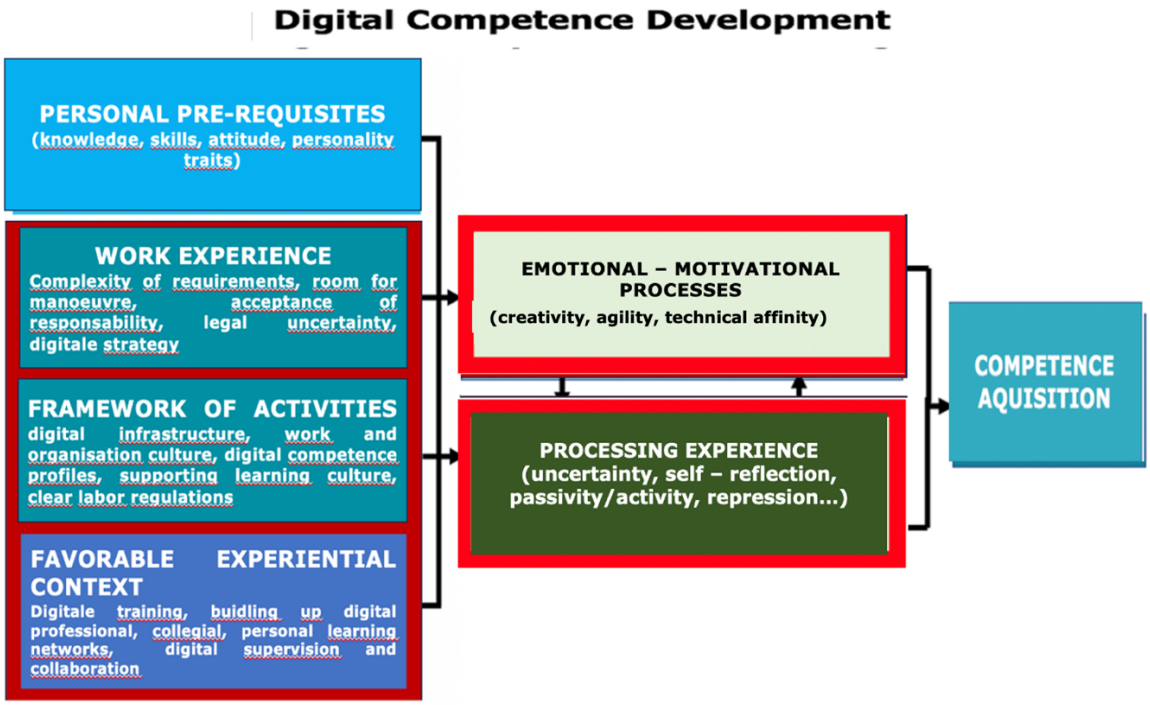
ITEM G3Q00005 Which of the DC training formats you have used have you found helpful in your professional practice? N = 181	**Percent of responses**
Learning by doing at workplace (SQ008)	54%
Informal supoort by fiends/family/colleagues with digital experience (SQ011)	42%
Online-Tutorials (SQ004)	39%
Internet Surfing (SQ001)	26 %
Interactive webinar by and with SP (SQ016)	23%
Digital Literature (specific databases, E-Books, PDF-Docs) (SQ003)	21%
Listening to professional Online-presentations (e.g.. via Podcasts) (SQ005)	17%
Interactive web conference by and with SPs(SQ017)	17%
Online learning group with colleagues/SPs on digital working in a professionally relevant problem situation (SQ014).	14%
Online-Self-directed learning platform with learning modules (web-based training, Apps) (SQ010)	14%
Blended learning: training with a mix of face – to- face meeting in a group of SPs and individual online – learning formats (SQ015)	12%
Following scientific blogs. forums, Twitter, Facebook pages of various professionals (SQ006)	4%
Printed professional literature (SQ002)	8%
Personal coaching or mentoring at workplace (SQ012)	7%
Feedback and advice by superiors (SQ013)	6%
Interactive Online-Formats (e.g. simulations, game - based learning) (SQ009)	5%
Online- or Offline-courses leading to certificates of DC (SQ018)	6%
Individual Online Learning Network (SQ007)	3%

It could be assumed that there was uncertainty among at least one-fifth of SPs about what DC meant in their professional practice.

In summary, it could be concluded that most respondents indicated a need to develop DC, but this need was relative. A decisive barrier to participation in further training on DC was the lack of working time and service-law regulation of continued training. Under these conditions around two-thirds of respondents preferred other training topics than DC. There was less interest in expanding professional digital competence and more interest in solving current professional challenges with the help of digital resources. Self-directed, informal, and fast formats were preferred for the acquisition of DC. Around one-third of respondents had acquired most of DC at universities, with two-thirds having acquired most or all DC by their own learning, by support of their private environment and by learning by doing at work. The digital usage habits of the surveyed SPs suggested that SPs were only aware of a limited number of informal, self-directed learning opportunities and did hardly use collaborative interactive online formats for their own competence acquisition. An improved information of SPs on what DC meant and which learning formats were available could have improved their participation in DC acquisition.

The use of digital resources in one's own training seemed to be closely related to the SP's attitude towards DT. v

FIGURE 49 *Determinants of Competence Acquisition in School Psychology*
Source: FRANKE 2005, p.56



A final summary of the analysis on DC in school psychology practice offered the **FRANKE model** on determinants of competence acquisition. In the red-framed boxes, key parameters for the acquisition of digital competence by SPs in the studied countries were shown based on the survey results (Figure 49).

Deficiencies in digital infrastructure, lack of digital support in the form of technical support and management responsibilities, professional legal uncertainty in the application of a digital way of working, lack of information about the significance of DC in school psychology practice and about digital educational formats, and a lack of coordinated multi professional and multidisciplinary cooperation were all important factors influencing a skeptical attitude of SPs in the use of digital resources in their profession and slowing down DC acquisition, despite DC being evaluated by more than 80% of SPs.

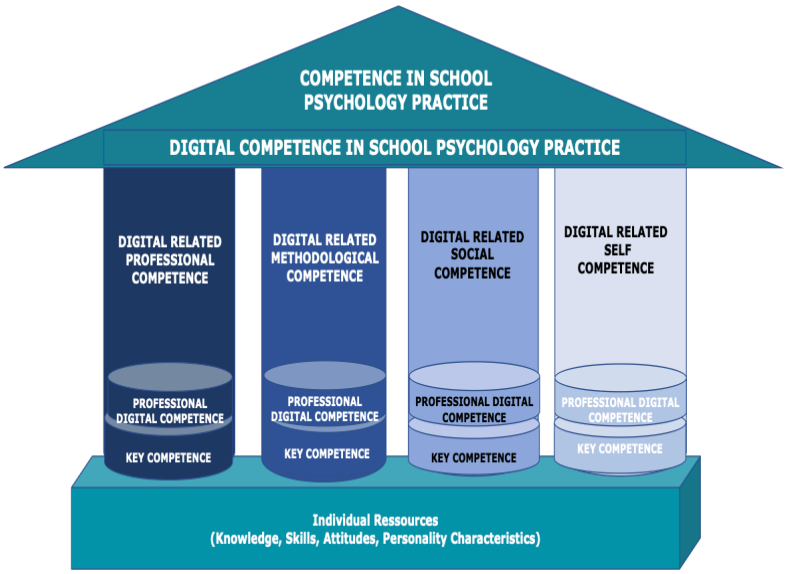
Though SPs seemed to have a great potential for coping resiliently DT, important pre-requisites needed to be in place to integrate a remote way of work into their daily practice. On the emotional-motivational side, key competences, such as creativity, agility, affinity for technology, have emerged as determinants of digital usage. While around 30% of the SPs surveyed have processed their experiences in such a way that they could competently implement digitally related work, 16% have so far refused to deal with DT in their practice. The large proportion of almost 54% respondents were in the middle of processing their experience, while roughly 46% were uncertain about what DT meant for their professional practice. The uncertainty was accompanied by reactive behavior towards digital change ("Web 1.0") and rare behavior of actively influencing and shaping the digital space (e.g. development of media competence).
The assessment of uncertain labor law situation and the lack of infrastructural prerequisites by 41% of respondents as a "stumbling block to digital working" represented a significant constraint on the SP's digital competence acquisition. A comment from the questionnaire: *"I and colleagues would be willing and motivated to use digital resources to improve and expand our school psychology work, but this is institutionally made impossible. There is no one in the Ministry of Culture as a contact person for school psychology with professional and personal competence in this regard."*

Since, according to the FRANKE model, a favorable context of experience was an important determinant of the acquisition of digital skills, an expansion of the little-used interactive training formats, such as collegial online learning groups, scientific blogs or individual learning networks - given the lack of time and the desire for self-directed learning formats - as well as a digital 'buddy system' and digital supervision could have an enriching impact on school psychology practice and could contribute to strengthening the professionalism of SP.

10. SUMMARY OF STUDY RESULTS

10.1. DIGITAL COMPETENCE FRAMEWORK AND DIGITAL COMPETENCE IN SCHOOL PSYCHOLOGY PRACTICE

The aim of the study "Digital Competence Framework for School Psychology Practice" (DiCoSP) was to contribute to the professional qualification of School Psychologists (SPs) in DT by developing a comprehensive, needs-based digital competence framework that could serve as a compass for future education, training, and professional digital competence profiles. By means of a systematic literature review, two expert focus groups, two online questionnaires (N=282) and an online assessment of DC of SPs, a complex data basis was identified, which allowed to develop the structural framework of DC in school psychology practice. The developed DICOSP model could serve as a foil for an as-is analysis of existing digital competence profiles in school psychology institutions as well as existing curricula for the preparation of SP for professional practice in DT. Existing references to digital competence requirements as well as the lack of explicit mention of digital competence requirements could be systematically made visible and open for discussion.



The digital competence structure model consisted of an **architecture model of digital competence in school psychology** based on a model according to ROE (2002), and a **matrix of digital competence in school psychology practice** based on a model by HENSGE, LORIG and SCHREIBER (2009) and professional requirement profiles in Belgium (BE), Germany (DE), Austria (AT), Switzerland (CH);

PROFESSIONAL WORKFIELD		DIGITAL COMPETENCE											
		PROFESSIONAL COMPETENCE Data and Information-, Communication-, Media-, Technological Competence Key Competences			METHODOLOGICAL COMPETENCE Data and Information-, Communication-, Media-, Technological Competence Key Competences			SOCIAL COMPETENCE Data and Information-, Communication-, Media-, Technological Competence Key Competences			PERSONAL COMPETENCE Data and Information-, Communication-, Media-, Technological Competence Key Competences		
		Knowledge	Skills	Attitude	Knowledge	Skills	Attitude	Knowledge	Skills	Attitude	Knowledge	Skills	Attitude
PREVENTION AND INTERVENTION	COUNSELING,SUPPORT, GUIDANCE, PROMOTION												
	PSYCHOEDUCATION, TRAINING , PUBLIC INFORMATION												
	TREATMENT/ THERAPY												
	CRISIS INTERVENTION												
ASSESSMENT, EVALUATION	ASSESSMENTS												
	TESTING												
	DECISION MAKING, REPORTING												
	EVALUATION, MONITORING												
	SCIENTIFIC PRACTICE												
ADMINISTRATION, PROFESSIONAL DEVELOPMENT	ADMINISTRATION												
	LIFELONG LEARNING, CONTINUED PROF DEVELOPMENT												
	PROFESSIONAL COLLABORATION/ NETWORKING												
	WORK ORIENTATION (INDIVIDUAL ORGANIZATIONAL)												

MATRIX OF DIGITAL COMPETENCE IN SCHOOLPSYCHOLOGICAL PRACTICE

and a **definition of digital competence** in school psychology practice based on ERPENBECK (2017), FERRARI (2012), LARRAZ (2013), ROTH (1971), and REETZ (1999):

***"Digital competence in school psychology practice** is a disposition to be able to act in digitally related professional situations in a self-organized, creative, critical, responsible, and goal-oriented manner on the basis of individual resources – a set of personality traits, digitally related knowledge, skills, and attitudes - within an organizational structure.*
Digital competence consists of the competence classes digital-related professional, methodological, social, and personal competence. Each digital competence class is a synthesis of school psychological competence, transversal key competence, and professional digital competence. Professional digital competence consists of the competence classes data and information, media, communication, and technology competence."

The DiCOSP Matrix based on professional, methodological, social, and personal competence (PMSP) categorized by knowledge, skills, and attitudes (KAS) enables a flexible classification of the entire spectrum of school psychological practice related to DT. The flexibility of the matrix seemed to be necessary given the rapid changes in all professional areas due to technological advances:

- Selection, implementation, evaluation of digital related theories, models, concepts, e.g. cognitive theory of multimedia learning
- areas of action, e.g. excessive internet use
- working conditions, e.g. legal regulation of remote work
- work processes, e.g. tele-counseling.

An example of the matrix categorization as ″knowledge of digital-related methodological competence", which included the key competence "ability to analyze/critical thinking" as well as "professional media competence" is "*SP know and critically reflect on standardized electronic testing procedures to assess and evaluate personal, cognitive, psychosocial skills, vocational interests."*

The DiCoSP - study gave answers to the questions

- Which role does DC play in the SP's professional practice?
- How does the digital usage of the SP look like?
- What is the nature of the SP's need for DC acquisition?

DT has affected all areas of school psychology practice in AT, BE, DE, and CH. Two-thirds of the DiCoSP surveyed SP worked in environments adapted to the digital change. Almost all DiCoSP - respondents used the internet daily for professional purposes in all school psychology fields of practice. DC was most often considered to be important and digital resources were used by most respondents in the work field of 'administration and professional development (administrative tasks, communication with target groups, collegial cooperation, own training)', followed by the work fields of 'prevention' and 'assessments/evaluation'. Least appreciated was DC and the use of digital resources in the field of 'intervention (treatment/therapy, learning support, health promotion, crisis intervention)'.

DC was considered as an important determinant of the development of remote work in school psychology. A statistically significant relationship was found between the assessed importance of DC and the frequency of use of digital resources. An assessment of DC as being important was associated with more use of digital resources. These findings supported MARTIN'S (2008) hypothesis of DC being an agent of cultural transformation of school psychological work.
"Thus, for individuals to view themselves as developing digital literacy and to reflect on the implications of that for their identity and their life plays a part in helping to build socio-cultural patterns which give people some understanding and sense of control in an unstable age." (MARTIN 2008, p. 174)

Transversal key competences are an important component of DK in school psychology practice. A statistically significant relationship was found between key competence, DK, and attitude towards DT. More technology-affine respondents seemed to have knowledge of electronic testing procedures and more creative respondents did not view digital-related work with students as an emergency solution than respondents without this competence (APPENDIX 23 SIGNIFICANCE TEST 34). These

connections justified the integration of key competences into the DiCoSP competence framework as part of digital school psychology competence.

The consideration of work fields was a necessary condition for the comprehension of DC in school psychology practice.
Statistically significant differences were found in DC between the school psychology fields of activity. While no country-specific differences were found in the estimated importance of DC in the field of assessments, these differences were statistically significant in the field of counseling (SIGNIFIKANZTEST 24,27,29,34). While in the field of counseling the culturally influenced attitude towards DT was significantly related to the use of digital resources, this was not the case in diagnosis. These differences justified the breakdown of DC into school psychology work fields in the DiCoSP Matrix.

DK was seen as a necessary condition for using digital resources, but not as a sufficient condition. In accordance with the internationally recognized UTAUT theory on the acceptance and use of technology (VENKATESH et al. 2003), the DiCoSP study also found that DC and the use of digital resources were influenced in school psychology practice by

- social circumstances (job-specific context in the work field, culture)
- the effort and performance expectations
- facilitating conditions, such as digital infrastructure.

Social circumstances

No statistically significant connection could be found between the SP's attitude towards DT and the following sample characteristics

- Gender
- Age
- Seniority
- Part-time/full-time employment
-Management function (no management/management/position in supervisory authority)
- Urban/rural environment
- Place of work (primary/secondary school; place of work school /central school psychology service outside school).

A statistically significant relation was found between the "**attitude towards DT"** and the **"Estimated importance of DC" and "Use of digital resources".**

A statistically significant relationship was found between the attitude towards DT and the use of digital resources in the work fields of

"counseling" and "collegial collaboration". It could be assumed that more SPs used digital resources in collegial collaboration and in counseling if they viewed DT as an enrichment of school psychology than if they expected no impact or an impoverishment of school psychology. Statistically significantly, for example, more Swiss than German respondents believed that DT would hardly change school psychology or would impoverish it in some areas.
Accordingly, a statistically significant relationship was found between the country of work and the use of digital resources in collegial collaboration. It could be assumed that more Swiss than German and Austrian SPs did not use digital resources or only occasionally used them in collegial collaboration (APPENDIX 23, SIGNIFICANCE TEST 52). This result supported the assumptions of ERPENBECK and GENNER that norms, values and attitudes are an important component of DC and due to their influence, should be included in educational offers to promote DC.

Since a **statistically significant relationship** was found between the "**country of employment"** and the "**attitude towards digital transformation/the assessment of the importance of DK/the use of digital resources"**, the conclusion was obvious that a cultural factor influenced school psychology work priorities and thus also the attribution of meaning to DC per work field and, as a result, the use of digital resources.

The importance of DC was statistically significantly unequally distributed in the countries examined in the field of 'counseling', but not in 'assessments', while the frequency of use of digital resources in 'counseling' was equally distributed between the countries, but not in 'assessments'. Statistically significantly more Austrian and German respondents than Belgian and Swiss respondents found DC important in counseling, but all of them used at least 87% of digital resources in counseling. A possible reason for the discrepancy was probably the crisis mode of the pandemic. 92% of those surveyed cited the pandemic as the driver of remote work in school psychology. The higher frequency of use of digital resources in school psychology due to the Covid-19 pandemic described in the literature could be confirmed by the DiCoSP results in the field of counseling.

Effort and performance expectations

The SPs were asked about their attitude towards remote work with students and colleagues compared to the traditional way of working. A statistically significant relationship was found between the assessment of online encounters with students as an emergency solution and the place of employment in DE/AT. Although the result had to be interpreted with caution due to a small sample, there was a certain plausibility that more Austrian than German respondents viewed remote work as an exception

and personal counseling as THE reference model. Among the SPs in the four countries, Austrian SPs most frequently did not use digital resources in 17 school psychology work fields and statistically experienced significantly more than German respondents, the increasing use of digital media in school psychology as ambivalent or negative. With these differences, the influence of the digital infrastructure also had to be considered. The Austrian respondents faced a less digitally adapted infrastructure than the respondents from the other three countries. Austrian respondents most frequently criticized inadequate digital infrastructure (62%), with 81% criticizing the WIFI connection at work, specialist software equipment and 55% criticizing IT support.

The result on the frequency of use of digital resources for one's own training (TABLE 67) corresponded to the impression that dealing with the topic of DT was viewed from the aspect of added value. Around 6 times more respondents who viewed DT as an enrichment for school psychology used digital resources in their own training than respondents who thought that DT would bring about no change or impoverishment in school psychology.

Facilitating conditions

There were no country-specific differences in the estimated importance of DC in the field of assessments. In contrast, a significant relationship was found between the country of employment and the use of digital resources in assessments (APPENDIX 23 SIGNIFICANCE TEST 14 and 40), whereby it could be assumed that more Swiss than German and Austrian respondents used digital resources in assessments. Such a relationship was not found in the field of counseling. While a statistically significant relationship was found between the attitude towards DT in school psychology and the frequency of use of digital resources in counseling (APPENDIX 23 SIGNIFICANCE TEST 24,27,29,34), the empirical findings suggested that the attitude towards DT in diagnostics did not appear to play a relevant role for the use of digital resources (APPENDIX 23 SIGNIFICANCE TEST 25, 41,44).

- While in most work fields a positive attitude of SP towards DT was significantly related to increased use of digital resources (APPENDIX 23 SIGNIFICANCE TEST 24,27,29,34), this connection did not apply to test diagnostics (APPENDIX 23 SIGNIFICANCE TEST 25,41). 34% of those surveyed who perceived digital change as enriching did not use any digital resources in assessments, while in most other work areas this percentage was below 12% (TABLE 31).
- Although significantly more Swiss than German SPs thought that DT hardly changed anything in school psychology or made it poorer in some areas, they used significantly more digital resources in assessments than the German respondents (APPENDIX 23, SIGNIFICANCE TEST 22).

- No statistically significant relationship could be found between the use of digital resources in assessments and
  - the expectations regarding the impact of DT on school psychology (APPENDIX 23 SIGNIFICANCE TEST 25);
  - the expectations regarding the development of use of digital media in school psychology (APPENDIX 23, SIGNIFICANCE TEST 44);
  - the perception of the increasing use of digital media in school psychology (APPENDIX 23 SIGNIFICANCE TEST 41);
  - technology affinity (APPENDIX 23 SIGNIFICANCE TEST 39).

The question arose as to what conditions existed so that Swiss SPs apparently worked more digitally in assessments than SPs in other countries.

In an international comparison (IMD World Digital Competitiveness (WDC) Ranking), the CH was the best digitally equipped and also performed best in the DICOSP results on workplace equipment of school psychology services with specific software and the frequency of use of virtual tests (TABLE 38). Half of the Swiss respondents (54%) had workstations that were well to very well equipped with specialist software. They most often used electronic tests (57%), with around half of the Swiss respondents (46%) feeling competent to do so. 72% of the Swiss respondents considered DC in assessments to be important and also used digital resources in the field of assessments (77%).

In contrast, in Germany the availability of specific digital software appeared to be lower (32%) and was used to a limited extent. 80% never used electronic tests, although almost half of those surveyed (48%) said they were familiar with electronic tests. 58% considered DC to be important in the field of assessments and 50% used digital resources in assessments.

A comparison of the DiCoSP questionnaire results for German and Swiss SP led to the following characteristics:

- The assessment of the importance of DC between Swiss and German respondents was equally distributed (APPENDIX 23, SIGNIFICANCE TEST 7);
- Knowledge of electronic tests was equally distributed (TABLE 32)
- Statistically significantly more Swiss than German respondents used digital resources in assessments as well as electronic tests (APPENDIX 23 SIGNIFICANCE TEST 14 and 40).

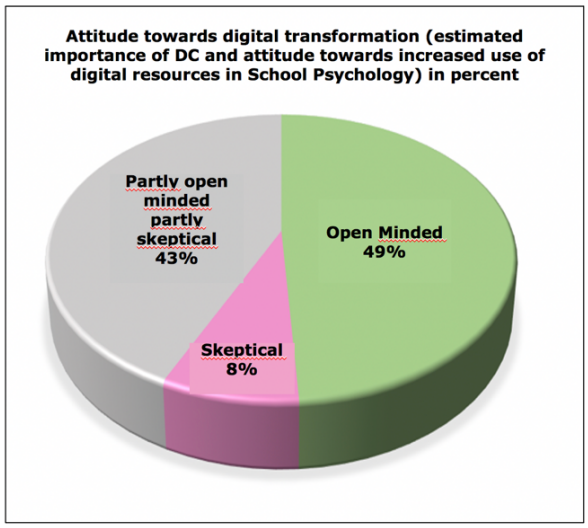
A statistically significant connection was found between

- knowledge of electronic tests and the use of digital resources as part of an integrated remote work in school psychology (APPENDIX 23 SIGNIFICANCE TEST 50).

- the use of electronic tests and self-assessed knowledge of electronic tests (APPENDIX 23, SIGNIFICANCE TEST 15),

- the use of electronic tests and the availability of specific software (APPENDIX 23 SIGNIFICANCE TEST 43). More Swiss than German respondents had better equipment with specialist software (TABLE 57) and more Swiss than German respondents also used digital resources in assessments.

Based on these findings, it was concluded that the **knowledge and use of digital resources in assessments was statistically significantly related to the digital equipment of school psychology services.**



The results of the SP's attitude towards DC and DT showed that at least three quarters of the SPs surveyed believed they had good prerequisites to be able to cope with the professional challenges of remote work in school psychology practice:

- 83% rated DC as important in their daily work;
- 84% believed that DT will enrich school psychology;
- 76% used frequently or occasionally digital resources for professional purpose;
- 77% considered themselves to be competent to handle digital requirements in their professional practice as needed;
- 86% felt self-efficient in their remote practice;
- at least 75% of the respondents felt to have needed key competences for the 21st century, such as self-organization, dealing with complexity and ambiguity, conflict management skills, willingness to embrace change, readiness for lifelong learning...;

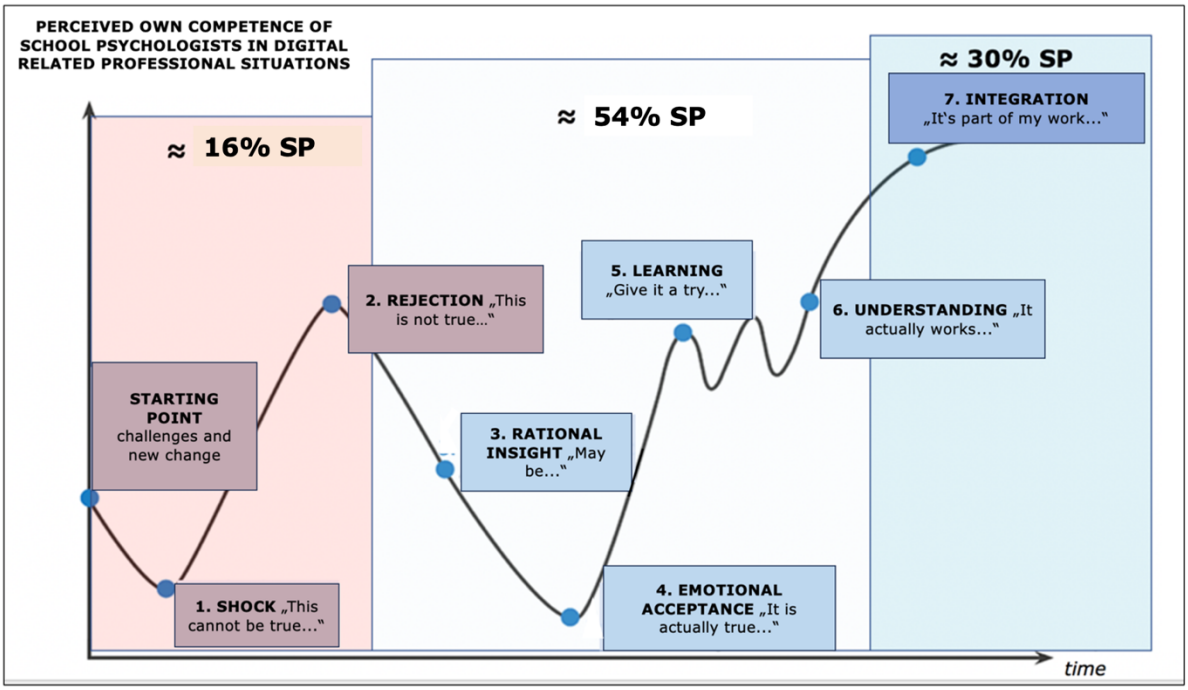
The respondent's own assessment suggested that most respondents were resilient (APPENDIX 23, TABLE 47) or, based on the salutogenesis model according to ANTONOVSKY (1997), were equipped with the necessary

sense of coherence and able to cope with DT in their profession in a healthy manner.

49% of those surveyed were open to a remote work in their professional practice, considering DC to be important and experiencing the increasing use of digital resources in school psychology as positive. 43% were partly open-minded, partly skeptical and 8% skeptical.

Despite the positive prerequisites, around half of the respondents' processing of their experience was characterized by uncertainty as to how the importance of DT could be classified in professional practice. 46% were either unsure about the importance of DC or about the increasing use of digital resources.

Processing DT of school psychology practice according to the Seven Phase Model of STREICH (1997)



The change management model with seven phases according to STREICH (1997) was helpful for assigning the questionnaire results to the processing of DT in school psychology practice (ASSIGNMENT OF THE DICOSP - QUESTIONNAIRE RESULTS TO THE STRETCH MODEL IN APPENDIX 23, TABLE 48) A third of those surveyed had remote work integrated in their professional practice and saw no barriers. Around 16% rejected remote work in school psychology practice. The majority, around 54%, were in transition phases 3-6. The uncertainty was accompanied by a several significant discrepancies, which made it clear that there was a need to develop the debate of the meaning of DT in school psychology practice in terms of professional policy.

Cognitive dissonance occurred while

- 34% of respondents valued DC, but were unsure or opposed to the use of digital resources in their professional practice;
- 42% of respondents were skeptical about the increasing use of digital resources in school psychology, but 76% used digital resources in their professional practice.

There was a frequent discrepancy between the estimated importance of DC and the self-assessed DC:

- 81% of respondents valued knowledge of technical solutions to protect confidentiality in digital counseling, 39% considered themselves to be competent, although 92% used digital resources in counseling;

- 79% valued knowledge of professional and legal standards to ensure the quality of their digital services, 38% felt competent;

- 84% found it important to be able to help schools prevent cyber-bullying, 44% felt competent.

- Discrepancies of around 20% in the competence classes of digital-related technical, social, and methodological competence

- 34% of respondents valuated DC but were unsure or opposed to using digital resources in their professional practice;

- 42% of respondents were skeptical about the increasing use of digital resources in school psychology, but 76% used digital resources in their professional practice;

A frequent discrepancy between the assessment of the DC importance and the self-assessed DC showed in:

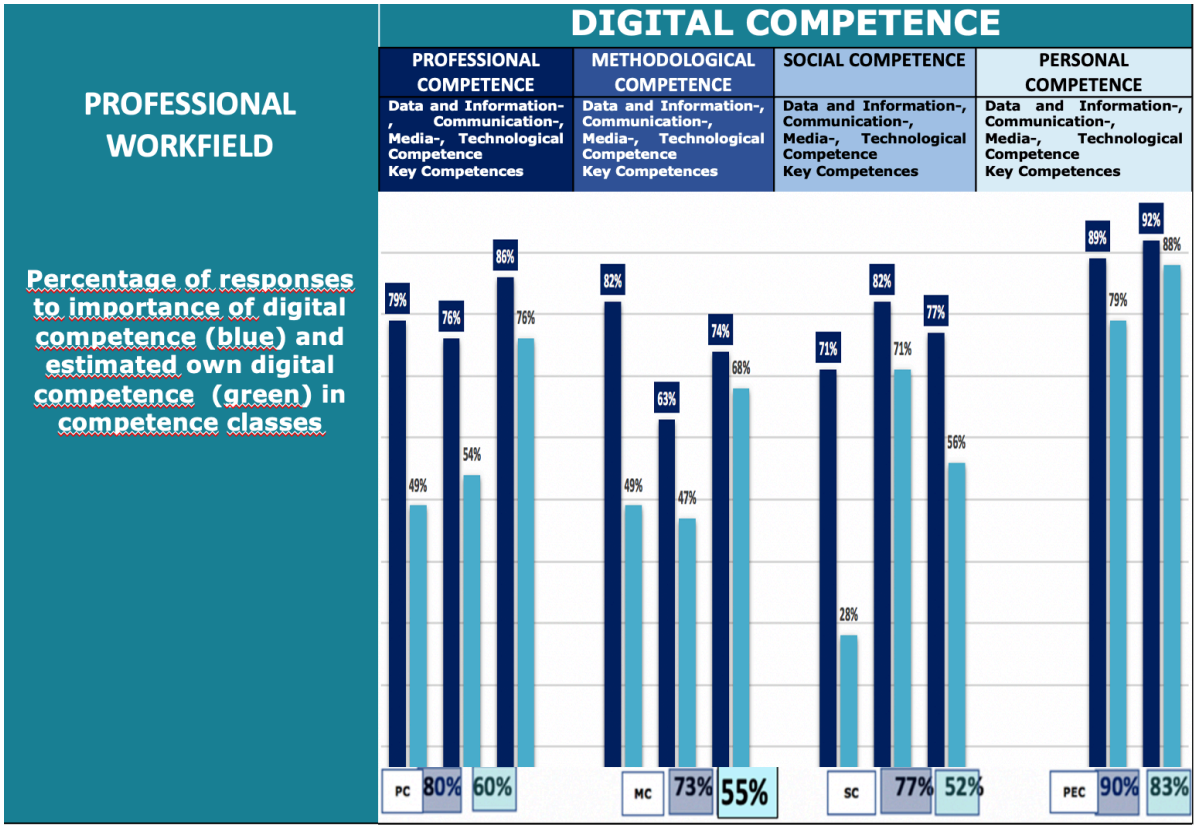
- 81% of respondents considering knowledge of technical solutions to protect confidentiality in digital counseling *(ITEM G2Q00003)* as an important digital knowledge, but 39% considering themselves to have this knowledge, even though 92% used digital resources in counseling *(ITEM G2Q00004SQ001).*

- 79% considering knowledge of professional and legal standards to be important for ensuring the quality of their digital services, but 38% feeling competent in this area;

- 84% feeling it was important to be able to help schools prevent cyberbullying, but 44% feeling competent to do so.

- Discrepancies of about 20% in digital related competence classes PSM.

DiCoSP Matrix on Assessment of DC importance and own DC in four competence classes PMS in percent



It was and still is necessary to develop guidelines for the SP's remote work as well as strategies to close the gap between the requirement and implementation of DC in professional practice in the interest of quality assurance of professional services.

To be able to address the uncertainty of half of those surveyed, it seemed most necessary for SP to acquire competence in relation to the knowledge base of DC classes FMS. Since the respondents' answers indicated that advanced digital methodological competence and media competence were of little relevance in school psychology practice and were rather low developed in SP, solution strategies should be developed to provide the necessary basic knowledge of digital-related methodological and media competence to convey remote work in school psychology practice. This task represented an interface for teamwork. DT is a complex challenge not only for school psychology services because it requires multi-professional and transdisciplinary collaboration. Competent remote work in school psychology could not and cannot be managed by SP alone, but requires sustainable cooperation of both technical and computer, legal and (school) psychological competence. Accordingly, it was suggested, for example, in the DiCoSP expert focus groups to provide either digital

specialists or specialized SPs with digital expertise in a school psychology service to support SPs with digital-related problems ('buddy system'). Two thirds of those surveyed estimated that their work environment had largely adapted to digital change, with 100% of Belgian, 72% of Swiss, 64% of German and 46% of Austrian respondents noting an adaptation. While most of those surveyed had good equipment at their workplace (hardware and software equipment, availability of PC workstations, IT maintenance and care), around a third found the IT support of school psychology staff to be inadequate (33%). Personal IT support at the workplace could therefore contribute to the promotion of DC for at least a third of SPs.

E*stimated importance of and own Professional Digital Competence*

Professional Digital Competence	**Important %**	**Competent %**
Informations- and Data competence	82%	72%
Communication competence	73%	60%
Technological competence	77%	46%
Media competence	55%	36%
Mean	72%	53%

The empirical results on the professional DC of the SPs surveyed suggested that SPs understood digital resources more in the classic sense as a means of information and communication ("Web 1.0") and less as an instrument for the (inter)active design of school psychology work on the creation of digital school psychological identity spaces, on the school psychological influence on digital spaces, content, and products or on collaboration through networking. Most respondents thought they had digital communication skills and information and data skills and valued these in their professional practice alongside technology skills. Accordingly, most respondents rated DC as important in the professional roles of communicator, organizer and professional and most felt competent in it. This assessment was reflected in the results on digital usage behavior in school psychology work fields. Digital resources were most frequently used for collegial collaboration, communication with target groups, advice, and administration. The fewest respondents valued the media competence required for digital interaction and only around a third thought they were media competent. In this area, the frequent discrepancy between estimated importance of DC and one's own competence was also evident, with 82% rating media-reflexive behavior as important, while around half of those surveyed considered themselves competent to reflect on their remote work and to develop it further.
Since the results for the estimated importance of collegial online working groups compared to offline working groups showed that around half of those surveyed were unsure or skeptical about digital collegial collaboration, it could not be expected that interactive digital resources were used by more than 50 % of SP surveyed. The results showed that

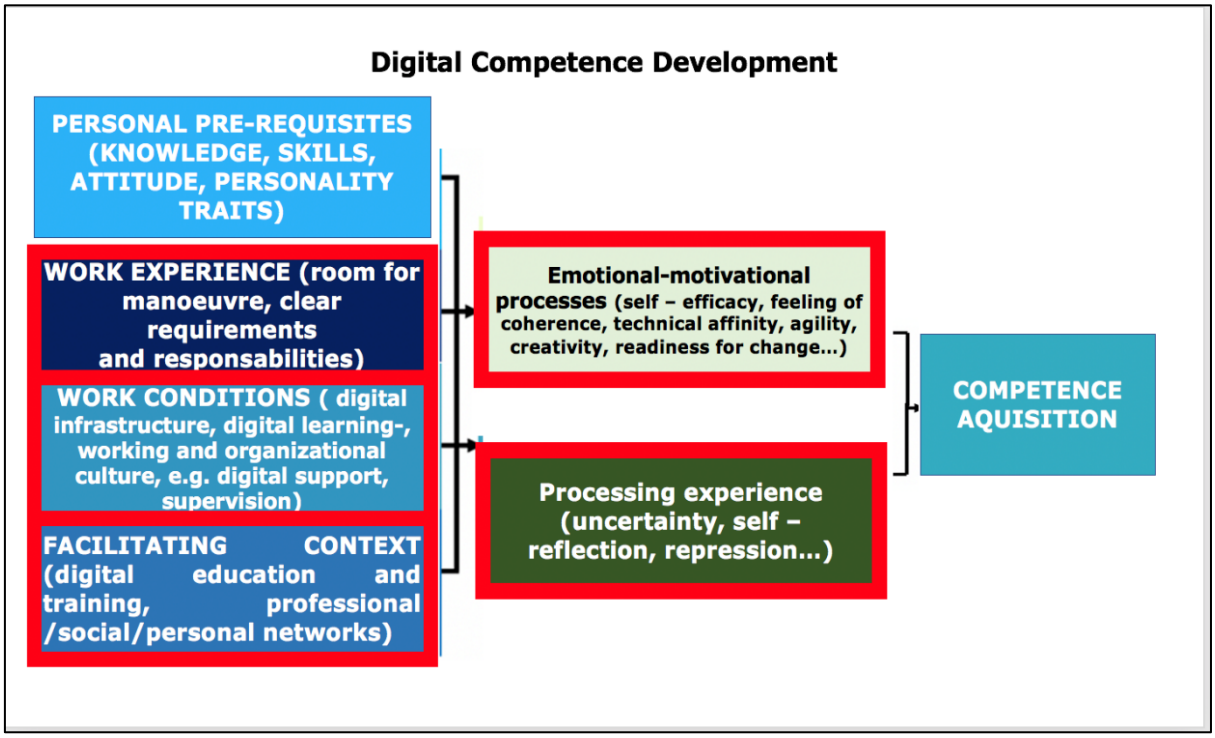
most respondents used digital tools in collegial collaboration for information and communication. Most respondents did not use digital tools as interactive working tools in collegial collaboration, such as tools for service and project planning in the form of Microsoft teams, cloud storage like Dropbox, collaborative writing tools like Etherpad. In comparison, non-interactive digital tools such as PowerPoint, Prezi, PDF documents were used by over 80% and, probably due to the digital boost of the Covid-19 pandemic, communication tools for conversations, meetings, and conferences, such as BigBlueButton or Zoom, were used by almost 90% of respondents.
For most respondents, face-to-face work was considered to be THE reference model in psychological counseling, as only 19% of respondents considered remote work with students and 35% with colleagues to be as valuable as non-digital-related work. Among the models offered, the model of combined online and offline counseling was most popular. 72% respondents estimated online encounters with students and 85% respondents estimated online encounters with colleagues as a good complement to offline working. This high level of popularity could be seen as a door opener for enriching school psychological counseling in the form of 'Blended Counseling' by overcoming the dichotomy between online and face-to-face counseling.
Two thirds of respondents estimated that their work environment had largely adapted to digital change, with 100% of Belgian, 72% of Swiss 64% of German and 46% of Austrian respondents noting an adaptation. Around half of all respondents found themselves confronted with inadequate digital infrastructure in the form of a lack of connectivity (WLAN connection) both at work (53%) and in schools (49%) as well as inadequate equipment with specific software (47%). While most of those surveyed had good equipment at their workplace (hardware and software equipment, availability of PC workstations, IT maintenance and care), on average around a third felt the IT support of the school psychology staff as inadequate (33%). **Personal IT support at the workplace could have contributed to the promotion of DC in at least a third of the SP.**

Almost half of those surveyed saw a barrier to SP's remote work in the infrastructural framework, unclear legal regulations for remote work, a lack of working time and a lack of support from management. In no ne of the studied countries there was a nationally binding regulation for SP remote work, so there was uncertainty in this area under labor law. The DiCoSP results on knowledge of the legal situation in connection with remote work showed the frequent discrepancy between the estimated importance of knowledge and one's own DC at 40%. This discrepancy indicated a need for action in the provision of legal bases to be able to offer SPs professional security as an important prerequisite for remote work. Around a third of respondents indicated an interest in acquiring further skills on DT labor law issues.

Since around half of the respondents were not aware of any educational offerings on DC and 19% did not know which digital skills they needed, it could be assumed that better information about the importance of DC in school psychology and better information on DC training opportunities could open the door to needs-based digital competence acquisition. This work of information and offers is a task for professional organizations, providers of DC educational offers and employers.

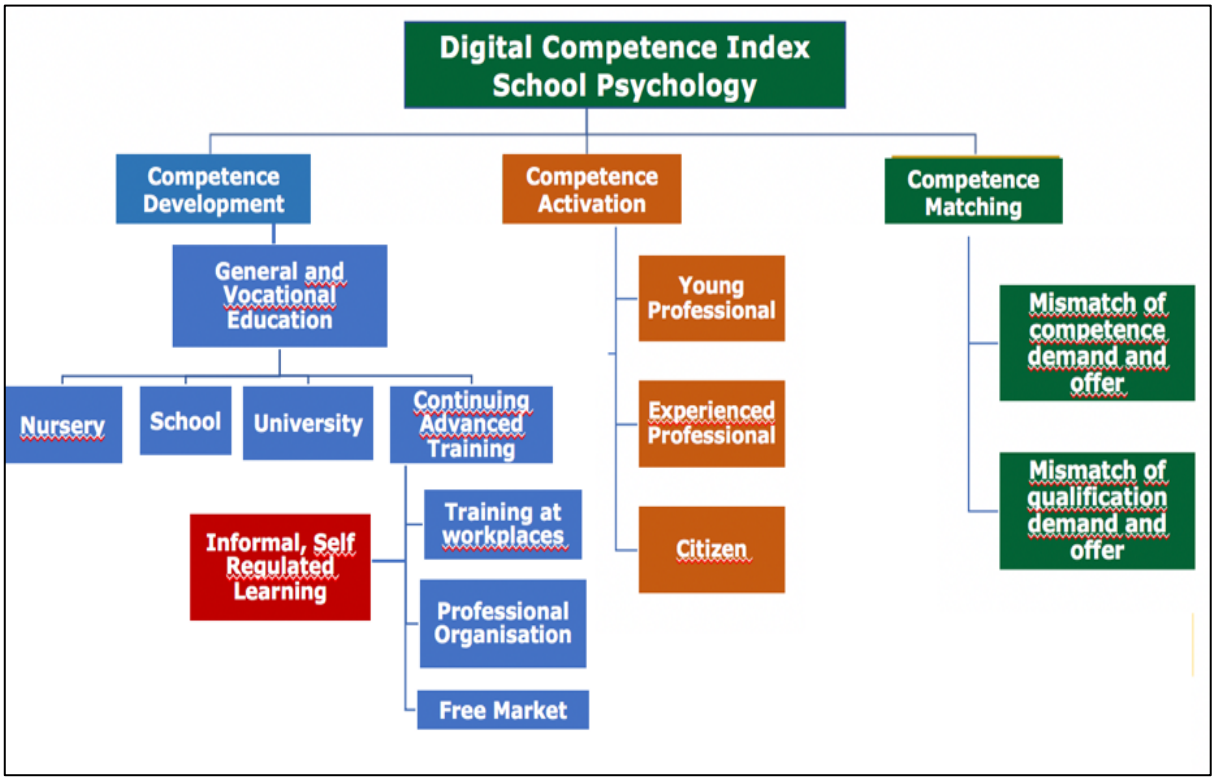
The FRANKE model was able to helpfully summarize the determinants of digital competence acquisition based on the DiCoSP results. Since a favorable context of experience is an important determinant of the acquisition of digital competence, an expansion of the little-used interactive training formats, such as collegial online learning groups, scientific blogs, or individual learning networks, could have had an enriching effect on school psychology and a contribution to strengthening the professionalism of SP - given the lack of time and the desire for self-directed learning formats.

Model of digital competence acquisition in school psychology practice



From the DiCoSP survey results on continued professional training, it could be concluded that current topics in professional practice enriched with self-directed digital learning formats represented a needs-based format for SPs in practice. Two comments from the survey illustrate this

need: “Independent learning is best”, “I would rather need professional context related on-the-job training”.
Based on the DiCoSP results, the model of the European Competence Index (ESI) by CEDEFOP 2018 was adapted for school psychology in such a way that informal, self-directed learning became part of a digital competence index for school psychology.



Digital competence index for school psychology

From a systemic perspective, the results indicated a need to standardize remote work of SP on the macro and meta levels of the school psychology working world (responsible politicians, professional associations, employer’s, and employee’s representatives), so that adaptation processes on the meso and micro levels would then be easier to implement. Against the background of the SP's uncertain labor law situation, a revision and updating of the legal and ethical framework of the SP's remote work seemed to be a necessary way to overcome professional problems of DT. A coordinated effort was required to develop guidelines for a digitally-related school psychology and a digitally competent school psychology organization, e.g. in the form of legal and ethical decision-making models. This was not only an individual task, a task of educational psychology, but above all a challenge for professional and employer organizations. Without such a basic frame of reference, a sustainable development of remote work in school psychology practice will hardly be possible.

In summary it can be concluded that SP then use digital resources if they

- see added value compared to the traditional way of working,
- feel secure in using digital resources at work due to a needs-based digital infrastructure and a clear professional position secured by employment law for remote work.
- are situated in a positive cultural climate towards DT.

If these prerequisites are not met, SPs feel uncertain about the assessment of the DC and DT and are hesitant to work digitally, which was also expressed in the questionnaire results in a more reactive than active attitude towards the DT.

10.2. LIMITATIONS

The DiCoSP study had several limitations:

- The relatively small sample (N= 282) prevented a generalization of the results to the SP profession. Only tendencies could be named.
- This also applied to cause-effect interpretations, since data were collected from a single source (SP) using a single method (online survey), interpretations of data could not rule out the possibility of common method variance. This was especially true for the method of online surveys, because the possibility could not be ruled out that the proportion of participants with an above-average affinity for digital use was high.
- The study could not explain how the different proposed dimensions (PMSP/KAS) of the competence framework were related. Future theoretical and empirical research needs to address this issue to uncover the underlying factor structure of DC at work. Such factor analysis could improve the structure of the DC framework in school psychology practice.

10.3. OUTLOOK

The digital age forced the practice of school psychology to rethink all professional work fields and to professionally shape DT. Based on the results of this study, five recommendations could be made for the future development of DC in school psychology practice:

1. According to ROE (2002), the creation of a competence profile required the steps of occupational/job analysis, competence analysis, competence modeling, and testing of the competence model. The first two steps were subject to this study so that a flexible modular matrix could be developed. In a **follow-up study** the competence modeling (differentiation of DC levels, specification of DC per work field with good practice examples, relationships between competence classes

and relevant knowledge, skills, and attitudes) and testing of the competence model should take place to arrive at an empirically validated digital competence framework for school psychology practice.

2. A professional policy guide for remote work in school psychology should be developed, which follows a creative, holistic approach to be able to create school psychological identity spaces in the digital world. It is important to promote innovations and improvements through DT, as well as to prevent, critically analyze and evaluate undesirable developments, risks, and impairments. Such a guide should, among other things, contain a description of the necessary digital infrastructure of the workplace, information about examples of good remote practice for orientation, as well as ethical-legal standards and decision-making models for ethical-legal dilemmas in remote work.

3. It is necessary to develop binding labor law regulations for SP's remote work.

4. There was a need for DC acquisition of the SP in practice (e.g., management skills and strategies for developing a digitally competent organization, digitally related knowledge, skills of digitally related methodological competence as well as digitally related media competence, development of digital learning communities, information about needs-based training offers, preparation and facilitation of workplace related self-directed learning formats), which can be most effectively addressed by digital self-directed learning formats on current practice-related problems. This required the development of **an 'enabling' educational and work culture**. Within an organizational structure, DC could be developed through a 'school psychology buddy system', whereby positions are designated as a permanent part of a team for SPs with digital expertise or digital professionals with expertise in the psychosocial field who can support colleagues with digital-related needs and/or provide supervision.

5. The DT of school psychology practice cannot be managed by school psychologists alone. To develop meaningful and effective digital methods and 'products', multi professional and multidisciplinary collaboration between professionals in school psychology (practitioners as well as researchers), computer science, law, education, social and communication sciences, and digital design/development, among others, is necessary. **Building long-lasting structural collaborative communities** is therefore an important component of remote work in school psychology.

To support the process of good practice sharing, the DiCoSP study set up a website https://dicosp.eu/en/, which will be further developed to serve as a platform of exchange for SPs for long term.

It is to be hoped for School Psychology that good conditions for success can be created for processing of digital – related requirements to enrich the range of services for the benefit of School Psychology’s target groups. In this sense, a concluding quote from a DiCoSP survey participant:

"Most of the clients are extremely well versed in the digital world, and we simply have to be able to keep up - otherwise we'll lose touch.”