



# STUDY DIGITAL COMPETENCE FRAMEWORK FOR SCHOOL PSYCHOLOGY PRACTICE (DiCoSP) – AN OVERVIEW

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## Content

1. DiCoSP – MODEL OF A DIGITAL COMPETENCE FRAMEWORK FOR THE SCHOOL PSYCHOLOGY PRACTICE	2
2. DIGITAL-RELATED COMPETENCE CLASSES PROFESSIONAL, METHODOLOGICAL, SOCIAL AND PERSONAL COMPETENCE (PMSP)	5
3. PROFESSIONAL DIGITAL COMPETENCE (PDC)	13
4. KEY COMPETENCE	14
5. PRACTICAL RELEVANCE OF THE STRUCTURE OF THE DiCoSP COMPETENCE FRAMEWORK	17
6. DIGITAL COMPETENCE DEVELOPMENT IN SCHOOL PSYCHOLOGICAL PRACTICE	21
6.1. PERSONAL PREREQUISITES	21
6.2. FRAMEWORK CONDITIONS OF THE ACTIVITY	22
6.3. EMOTIONAL-MOTIVATIONAL PROCESSES	25
6.4. FAVORABLE CONTEXT OF EXPERIENCE – CONTINUED PROFESSIONAL TRAINING	25
6.5. PROCESSING EXPERIENCE	28
7. DIGITAL CHALLENGES IN SCHOOL PSYCHOLOGICAL PRACTICE	30
7.1. MEDIA-REFLECTIVE SELF-COMPETENCE	30
7.2. ACTIVE DESIGN OF DIGITAL TRANSITION IN SCHOOL PSYCHOLOGY PRACTICE	31
8. OUTLOOK	33

Which digitalization campaign could have shown us better than the painful Covid - 19 pandemic that to date there has been no comprehensive concept of digital competence (DC) for school psychologists (SP). The pandemic accelerated rare research and knowledge on digital transformation (DT) in German-speaking European school psychology. Remote work developed slowly, although DT has been established in international school psychology

for over 30 years (CAEHILL 1998, KRUGER et al. 2002, HENNIGAN 2018, SONG et al. 2020, SCHAFFER et al. 2021, VON HAGEN et al. 2021, REUPERT et al. 2021, FARMER et al. 2021, SPILT et al. 2021, KING, BLOOMFIELD, WU & FISCHER 2021, SCIENTIFIC COUNCIL 2018, p.82). A comment from the DiCoSP study *"I think that many people have realized now how far behind we were in terms of the use of digital options and offers, ... in terms of the competence level and the willingness to work with students in this context."*

The research project "Digital Competence Framework for School Psychology Practice (DiCoSP)" (March 1, 2021 - February 28, 2023) was coordinated by 'MyGateKeeper' under the leadership of school psychologist M. Kant-Schaps in collaboration with Prof. C. Steinebach, Zurich University for Applied Sciences, and funded by the 2020/21 Grant Award from the International School Psychology Research Initiative Committee of the Society for the Study of School Psychology (SSSP) and the International School Psychology Association (ISPA). It broke new ground by developing a framework for digital professional skills of practicing SPs in Austria (AT), Belgium (BE), Germany (DE) and Switzerland (CH) as a compass for education and training as well as for digital competence profiles. The extensive research project could only be presented in excerpts in this overview. To support the exchange of good digital-related practice, the DiCoSP study has set up the website <https://dicosp.eu>, which is to be further developed as an exchange platform for SPs. The complete report with questionnaire, bibliography and appendices can be found under "DiCoSP - PROJECT" on this website.

## 1. DiCoSP – MODEL OF A DIGITAL COMPETENCE FRAMEWORK FOR THE SCHOOL PSYCHOLOGY PRACTICE

A systematic literature review, two expert focus groups and an online questionnaire for SPs (N = 282) allowed for the development of the DiCoSP model consisting of

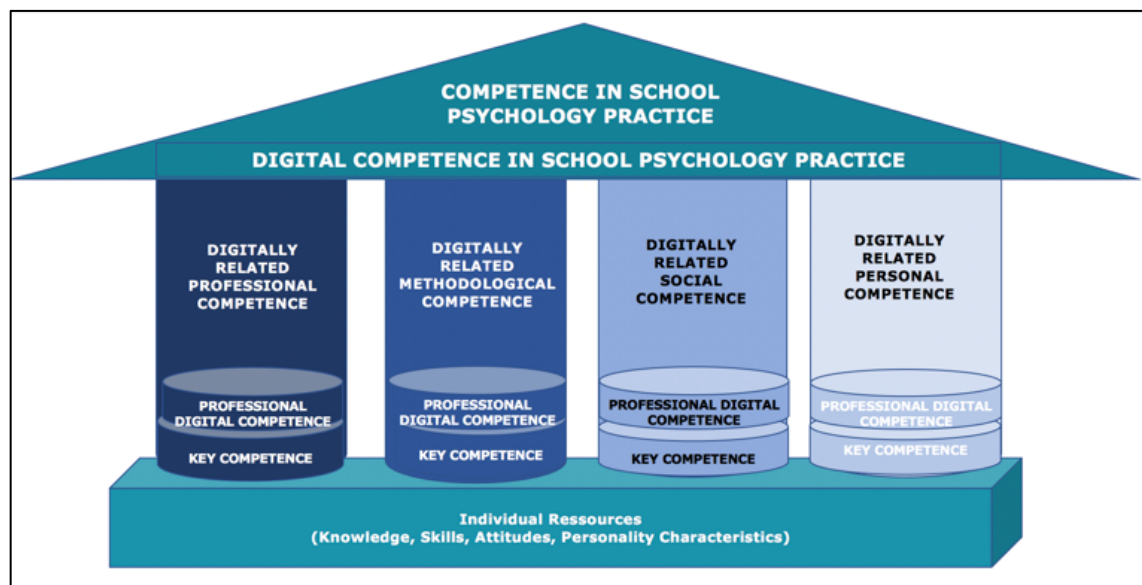
### □ A definition of DC

**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.

- the DiCoSP - ARCHITECTURE MODEL DC in school psychology practice - FIGURE 1

PROFESSIONAL WORKFIELD		DIGITAL COMPETENCE											
		PROFESSIONAL COMPETENCE			METHODOLOGICAL COMPETENCE			SOCIAL COMPETENCE			PERSONAL COMPETENCE		
		Data and Information-Communication-, Media-, Technological Competence			Data and Information-Communication-, Media-, Technological Competence			Data and Information-Communication-, Media-, Technological Competence			Data and Information-Communication-, Media-, Technological Competence		
		Key Competences			Key Competences			Key Competences			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)												

- the DiCoSP - MATRIX DC in school psychology practice - FIGURE 2



An example to illustrate the matrix (red box):

WORK ASSESSMENT AND EVALUATION	FIELD AND COMPETENCE	PSYCHOLOGICAL
WORK FIELD TESTS	<b>DIGITAL COMPETENCE IN THE SCHOOL PSYCHOLOGICAL PRACTICE</b>	SPs know psychodiagnostic methods for the assessment of performance, they can evaluate and apply them
	<b>1. Knowledge</b> base of the competence class 'digitally related methodological competence'	SPs have profound updated knowledge and a critical understanding of standardized digital procedures to assess and evaluate performance
	<b>2. Knowledge</b> base of 'Media competence', a class of professional digital competence within the class of methodological competence	SPs know and understand electronic tests to measure math abilities of fourth graders
	<b>3. Transversal key competence</b>	Critical thinking Having professional knowledge

It is about knowledge and understanding of digital diagnostic procedures in the field of test diagnostics, where methodological questions are relevant and the example can be assigned to digital-related methodological competence. It can be assigned to the professional digital competence "media competence" within the class "methodological competence" since electronic tests for measuring performance as a special digital tool can be assigned to "media knowledge". The example can be assigned to the transversal key competence "professional knowledge" and/or "critical thinking" depending on the focus of the user.

The DiCoSP competence structure model allows to flexibly create competence profiles of SPs and their organizations from a complex, theoretically based spectrum of DC and to supplement or eliminate competences that are required or superfluous due to innovative technology. At the expense of this flexibility is the fact that the allocation of basics and competence is not always clear. This area requires further research (KAUFFELD et al. 2007, KLIEME & LEUTNER 2006, NICKOLAUS et al. 2006, SPÖTTL et al. 2011, VON ROSENSTIEL 2001). For orientation purposes, an initial comprehensive collection of the basics of SP's DC was created as part of the study, which cannot claim to be complete, as neither evidence-based professional profiles of SP were available, nor can future requirements be foreseen due to rapid technical progress (DiCoSP - STUDY APPENDIX 13 ).

In the DiCoSP model, an essential element of the digital school psychology competence as a sub-competence of the general school psychology professional competence were the **three levels of the digitally-related competence classes professional, methodological, social, and personal competence (PMSP), the professional digital competences and the key competences**, which are discussed below.



## 2. DIGITAL-RELATED COMPETENCE CLASSES PROFESSIONAL, METHODOLOGICAL, SOCIAL AND PERSONAL COMPETENCE (PMSP)

The DC structure of digital-related competence classes of professional, methodological, social, and personal competence (PMSP) was based on the triad of self-, factual, and social competence by ROTH (1971) and was further developed by numerous scientists in psychology and pedagogy. It is still fundamental in the competence discussion today (BADER 1989, BECK 1995, BUNK 1994 ERPENBECK & VON ROSENSTIEL 2007, DEHNBOSTEL 2005, GENNER 2019, JÄGER 2001, KAUFFELD et al. 2003, LAUR-ERNST 1988, LÖFFLER 2017, ORTH 1999, PRUEMPER 2017, REETZ 1999, WEINERT 2001). ROTH did not see competence as the development of intellectual powers, but as the expression of "critically responsible" and "critically creative" ability to act as a model in education. *"For us, human ability to act is the necessary and at the same time dominant point of reference since the interaction of all human forces and abilities is expressed and fulfilled in the ability to act. In acting people, the different systems of forces and abilities do not appear separately, but in their cooperation."* (ROTH 1971, p. 381 free translation) This action-theoretical approach of competence as a disposition to judge and act was further developed by ERPENBECK (2017 a,b) in a model of a system-theoretically and constructivist-oriented understanding of competence. He understood 'competence' to be the following: *"Individual competences are based on skills, knowledge and qualifications, constituted by internalized [...] values, disposed as abilities to act self-organized and creatively, consolidated through experiences, realized by will and manifested as performance...Competences are self-organized dispositions of mental and physical action, if one understands dispositions as the entirety of the internal prerequisites for the psychological regulation of the activity developed up to a certain point in time."* (ERPENBECK 2010, p.51/2, free translation)

ERPENBECK considered the theoretically based concept of self-organization to be central in view of increasingly digitally transformed working conditions, which, in his opinion, required a new learning culture (ERPENBECK & HASEBROOK 2012, p.237, ERPENBECK et al. 2017b). *"Competences cannot be taught but can only be developed in a self-organized manner when overcoming real challenges. 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 the environment and produce from the inside out new solutions and new ideas as well as new actions... Digitalization requires learning and acting quickly, spontaneously, and self-organized at the workplace and on the Internet. Professional knowledge learned by heart is no longer sufficient."* (SCHRITT 2017, p.70, free translation)

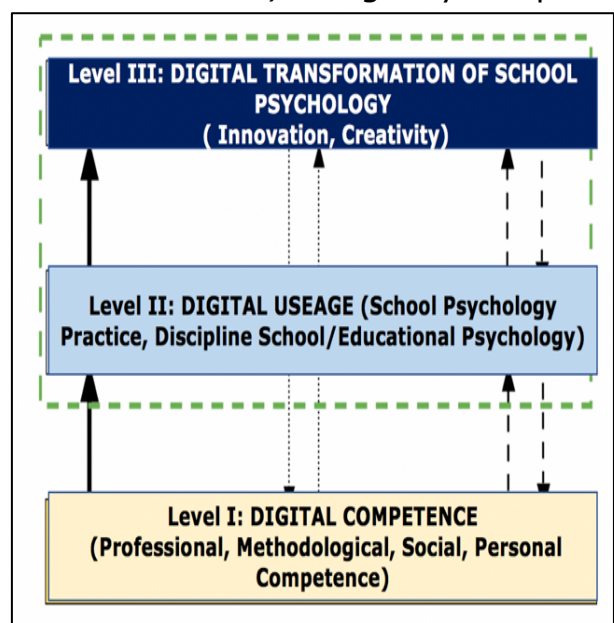
Like ERPENBECK's holistic approach, the 'Frankfurt Triangle' (WEICH 2019) also assumed that the manifestations of digitalization have different, mutually influencing aspects, namely not only a technological perspective (how does that work?), but also a social-cultural (what is the effect?) and

an application-related (how do I use this?). These three perspectives were considered in the development of the DiCoSP competence framework in the form of the PMSP competence classes and their basic knowledge, attitudes, and skills (=KAS).

In search of convergence in the complex understanding of 'digital competence', the DiCoSP study agreed with the assumptions that

- 'Competence' is a disposition to act professionally by self-organized bundling of an SP's existing resources.
- 'Competence' as an expression of 'maturity' including a critical, responsible, goal-centered, and creative attitude.
- 'Competence' consists of the classes of professional, methodological, social, and personal competence.
- Knowledge, skills, and attitudes (values) are the foundations of competence (WINTERTON & DELAMARE-LE DEIST & STRINGFELLOW 2006), with 'self-efficacy' being an important condition for acquiring competence (ARNOLD & ERPENBECK 2021).
- 'Competence' is situation and context specific and is acquired throughout life by formal, non-formal and informal learning in all environments.
- DC as a key competence in the rank of a cultural technique is closely related to other key competences.

One criticism of the understanding of competence through self-organization was the exclusive emphasis on individual responsibility. Professional actions are integrated into real structures, such as the organization of a school psychology service (BAETHGE & OBERBECK 1986, DEHNBOSTEL 2005, KIRCHHÖFER 2004). A digitally competent organization is an essential context



for the practically active SP, as it demands and conveys competence and makes competence effective (REINHARDT 2020, KAMPYLIS et al. 2015). This criticism was based on the understanding of DC as an agent of cultural change according to the model of MARTIN (2008) (Figure 3). It required the inclusion of the work environment of SP's in a digital competence framework. DT influences the working culture of school psychology by the fundamental importance of temporal and spatial shift (CASTELLS 2002/3).

**FIGURE 3** Own adaptation of MARTIN's model (2008, p.167) to School Psychology

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)

DC is therefore to be understood as job- and situation-specific because it relates to coping with problems, tasks, or objectives within the professional context. When using digital resources, SPs draw on skills and elements specific to their profession, personal history, and professional development. DC is therefore a key to opening the door to the digital world for school psychology, which in turn changes the school psychology work culture, whereby this is an individual and collective multi-stage development. Examples from the focus groups:

*"The accessibility of our services is of course much easier for clients who have online contact options. For example, for a single mother with several children, going to a counseling center represents a significant everyday organizational hurdle. Online she can receive counseling much more easily."*

*"Across the country, it is much easier to collaborate with colleagues because you can cleverly use video conferences and share documents."*

The 2020 annual report of a Swiss school psychology service was created under the impression of the Covid-19 pandemic and clarified the DiCoSP understanding of competence *"In general, the regulations to contain the pandemic, in particular the school closure... have put us under immediate digital pressure to adapt. Fortunately... at the time of the first lockdown, the SP - team was able to immediately access a Citrix remote environment to be able to access and process all case-related information externally... Nevertheless, it was new territory for us psychologists, clarifying discussions with parents and teachers to be carried out "online"... More elaborate counseling-therapeutic interventions and methods, such as the inclusion of spatial conditions and physical experiences (e.g. in a structural constellation) are only possible with difficulty on a screen... School psychological services should also expand their offerings in the event of such a development and focus on new problems."* (ANNUAL REPORT SCHOOL PSYCHOLOGICAL SERVICE PFÄFFIKON 2020 [https://spd-pfaeffikon.ch/fileadmin/user\\_upload/Organisation/Jahrsberichten/Jahrsbericht\\_2020.pdf](https://spd-pfaeffikon.ch/fileadmin/user_upload/Organisation/Jahrsberichten/Jahrsbericht_2020.pdf))

The complex, crisis - situation of the pandemic with school lockdowns caused instability. SPs faced new structures/behaviors. Familiar forms were used to maintain stability. Adaptation processes took place to create stability in the form of the continuity of school psychological services. ERPENBECK called this self-organization ability "competence," which initiated a change in the work culture.

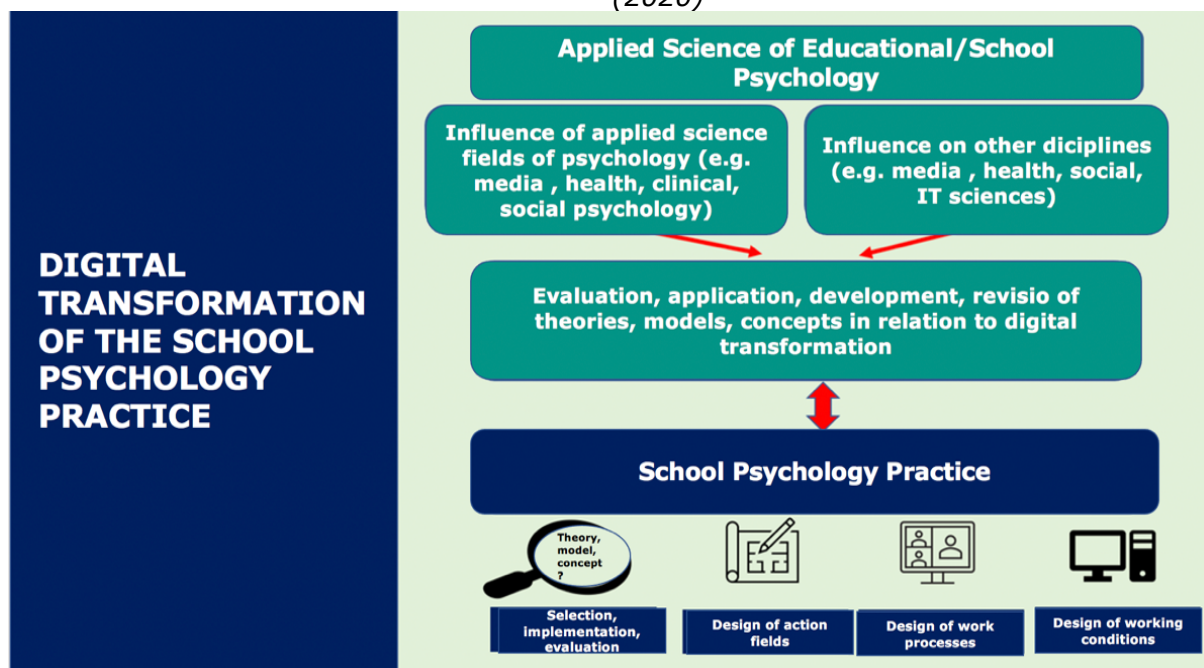
The literature review made it appear necessary that SPs deal competently with DT (Figure 4) in order to

- develop a well-founded position on the challenges and opportunities of a digital-related way of working for their

professional practice (ROMERO J. CASADEVANTE C., MANTORO H. 2020; MEZGER & TEIBER & OTT & MEYER 2000): What opportunities and risks does a digital way of working offer for SP? What significance do the effects of DT have in society for the professional field of action and role of SP, especially in view of the possible uses of artificial intelligence and 'big data'? (HARLOW & OSWALD 2016) When, how and why can DC be promoted in SP's education and training?

- be able to carry out their professional activities effectively in a digital environment, e.g. advising teachers on issues of e-learning (DRUMMER et al. 2011),
- ensure the quality of their services under digital conditions,
- create spaces of school psychological identity in the digital world by allowing SP to have a creative influence on DT: adapting digital-related theories, models, concepts, work processes and conditions, areas of responsibility and action, professional profiles and services, competent digital organizations (DE LA FUENTE & KAUFFMAN & DÍAZ-ORUETA 2018; FISCHER & KOLLAR & STEGMANN & WECKER 2013),
- secure a sustainable place for school psychology as a science, profession, and practice, also under digital conditions.

**FIGURE 4** DT in School Psychology – own presentation according to METZ/SPIES (2020)



These aspects had to be considered in a digital competence framework. Thus, the DICOSP study relativized the subject-related aspect of DC as self-organization (PMSP/KAS) by integrating the object-related side of DC in form of school psychological work fields as an influencing factor on the acquisition and performance of DC into the DiCoSP - MATRIX according to

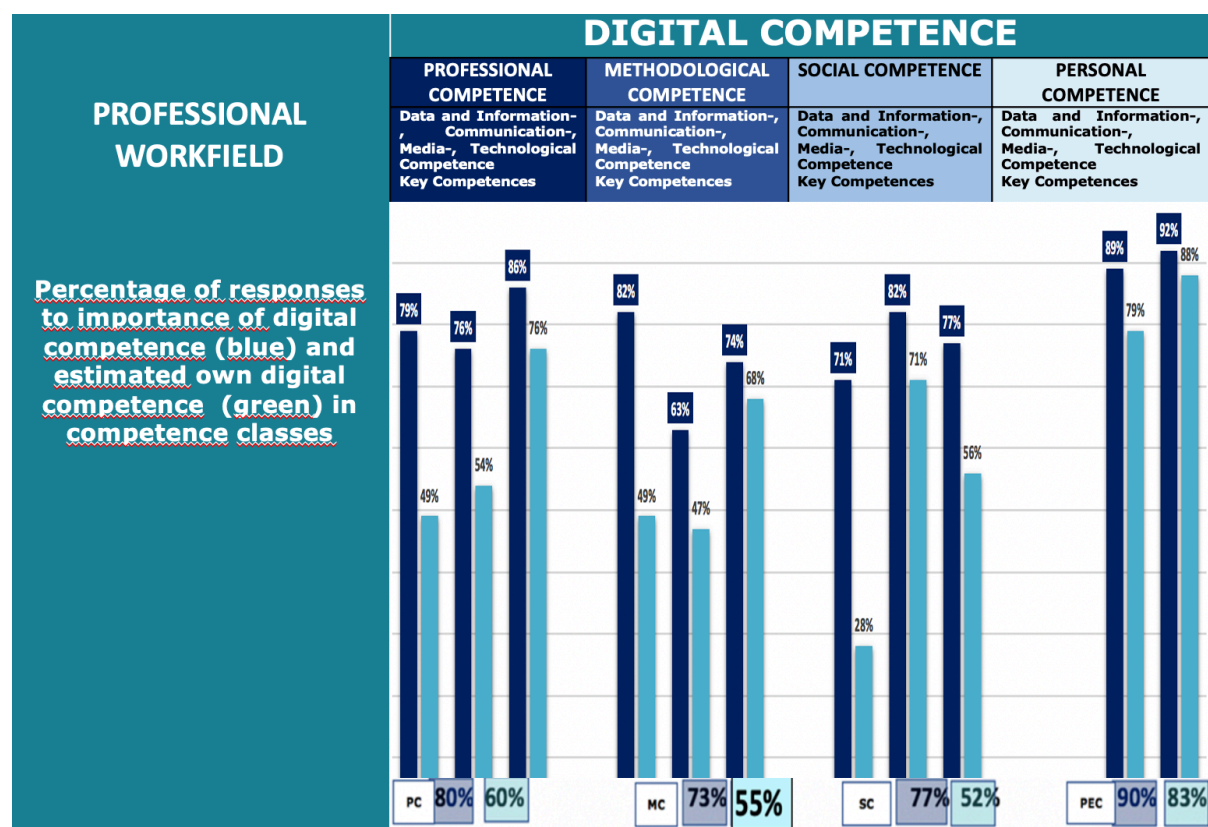


the theoretically based model of HENSGE & LORIG & SCHREIBER (2009). In the absence of evidence-based school psychology professional profiles, a comprehensive analysis of the professional requirement profiles of the SP in AT, BE, CH, DE led to a rough categorization into the following professional work fields, whereby the levels of individual, group and system as addressees must be considered in each work field:

- **Prevention** (counselling, support, and guidance (CSG) - psychoeducation, training of pedagogical staff, information for the public) and intervention (treatment/therapy, crisis intervention, learning support and health promotion)
- **Assessment and evaluation** (assessment/diagnostic work, tests, monitoring, evaluating, reporting/ report writing)
- **Administration and professional development** (oral and written administrative work, lifelong learning, continued professional development, professional collaboration, networking, individual and company work orientation).

Based on the empirical results of the DiCoSP online questionnaire, it could be concluded that most respondents considered the basic structure of the digital competence classes PMSP/KAS to be relevant in school psychology practice.

**FIGURE 5** DiCoSP DC framework with percentage of response frequency on the assessment of DC importance and assessed own DC, N = 189



The questionnaire items and the assignment of the questionnaire items to PMPS classes can be found on the DiCoSP website at: DiCoSP - STUDY, APPENDIX 15 and APPENDIX 24.

On average, 80% of the SP respondents rated DC as important in school psychology practice according to the PMSP classes and on average 62% considered themselves digitally competent (Table 1). Among the digital competence classes, "self-competence" was most often and "methodological competence" was least often considered to be important in school psychology practice. On average, the KAS basics of DC were considered to be important by almost the same number of respondents.

<u>Estimated importance of DC</u>	<u>Knowledge</u>	<u>Skills</u>	<u>Attitudes</u>	<u>Σ</u>
PC	79%	76%	86%	<b>80%</b>
MC	82%	63%	74%	<b>73%</b>
SC	71%	82%	77%	<b>77%</b>
PERC	-	89%	92%	<b>90%</b>
<b>Σ</b>	<b>77%</b>	<b>78%</b>	<b>82%</b>	<b>80%</b>
<u>Self – rated own DC</u>	<u>Knowledge</u>	<u>Skills</u>	<u>Attitudes</u>	<u>Σ</u>
PC	49%	54%	76%	<b>60%</b>
MC	49%	49%	68%	<b>55%</b>
SC	28%	71%	56%	<b>52%</b>
PERC	-	79%	88%	<b>83%</b>
<b>Σ</b>	<b>42%</b>	<b>63%</b>	<b>72%</b>	<b>62%</b>

**TABLE 1** *Percentage response frequency on estimated importance of DC and self – rated own DC in the basics of digital – related competence classes Professional (PC), Methodological (MC), Social (SC) ad Personal (PERC) Competence, N=189*

The assessment of SP's own DC showed greater differences. On average, 83% of the respondents considered themselves to be competent in the basics of digital – related "self-competence". In the comparison of the DC basics, on average the fewest respondents felt competent with 42% in the knowledge base of the PMS competence classes, followed by skills with 63%. Most (72%) felt to be competent in the attitudes basics of DC. Thus, it was **important** for most of the surveyed SPs **to be ready to act in a value-oriented manner in digital-related professional situations in relation to themselves**, such as actively engaging in change (ITEM G200005 SQ001), enjoying learning new things (ITEM G200005 SQ007), taking responsibility for a digital way of working (ITEM G200005 SQ007). Most of the PTPs also considered themselves to be competent to do so.

Striking results were that

- the fewest respondents were ready to have acquired skills to act in professional digital-related situations including methodological requirements compared to other competence classes. Also fewest respondents considered themselves to be competent to act in professional digital-related situations including methodological requirements.



□ **TABLE 2** *Percentage of response frequencies on items to evaluate importance of DC and self – rated own skills of digital – related methodological competence*

<b>Digitally METHODODOLOGICAL COMPETENCE MCS</b>	<b>related SKILLS</b>	<b>N=181</b>	<b>% IMPORTANT</b>	<b>% COMPETENT</b>
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%

It became obvious that advanced methodological competence (G2Q00003SQ011, G200003SQ015) was estimated as having little relevance for the school psychology practice (Table 2). Programming, for example, is an advanced skill in method/media competence (CARRETERO et al. 2017, p.35). While 19% of the surveyed SPs considered the ability to write simple programs to be important in school psychology practice, 10% were able to do so. 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 2018).

<b>Basics KNOWLEDGE N=181</b>		<b>IMPORTANT %</b>	<b>COMPETENT %</b>
G2Q00003 SQ017	I know electronic test procedures for students and can critically evaluate their psychometric qualities.	68%	48%
G2Q00003 SQ020	I know which information about students can be stored	84%	44%
G2Q00003 SQ023	I understand the impact of <u>digitalization on school psychology</u> .	87%	67%
G2Q00003 SQ022	I know professional and legal standards to ensure the quality of my digital services	79%	38%
G2Q00003 SQ013	I know technical solutions to protect confidentiality in digital consultations	81%	39%
G200003 SQ005	I know how to protect my own <u>digital identity</u>	83%	60%
G2Q00003 SQ010	I know about copyrights and licenses	71%	28%

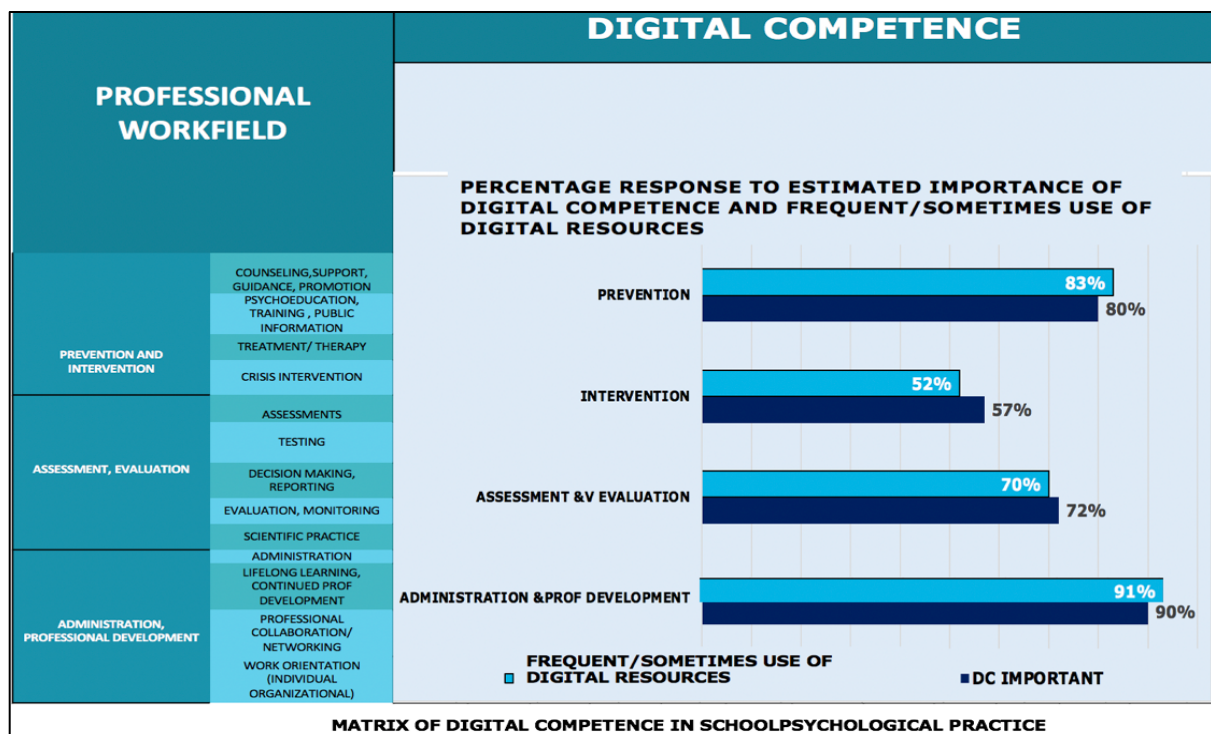
**TABLE 3** *Percentage response frequency on estimated importance and own competence in knowledge base of DC*

- fewest respondents felt competent in the knowledge base of DC (Table 3). This also included the result (ITEM G3Q00003) that around 20% of the surveyed SPs did not know which DC they needed in their professional practice.

**TABLE 4** Percentage frequency distribution for ITEM G2Q00004 and percentage difference between assessment of the importance of DC and the use of digital resources in 17 work fields

Item G2Q00004 Percentage of responses finding DC rather/very important and occasional/frequent use of digital resources N =187	Importance of DC %	Occasional/frequent use of digital resources %	Difference of percentages
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

**FIGURE 6** Percentage of response frequency on ITEM G2Q00004 per work field: estimated of DC as important and frequent/ occasional use of digital resources in work fields, N=189



On average, digital resources were used in 17 areas of school psychology by 76% of surveyed SPs, frequently by 30%, occasionally by 46% and never by 24% (Table 4). On average, 77% of the respondents estimated DC to be important (Figure 6). Most respondents considered DC to be important and used digital resources in the field 'Administration and professional development', followed by the work field of 'Prevention' and 'Assessment/Evaluation'. **Fewest respondents valued DC and used digital resources in the work field of 'intervention'.**

### 3. PROFESSIONAL DIGITAL COMPETENCE (PDC)

Professional digital competence (PDC) was theoretically divided into four basic classes (ALA-MUTKA u.a. 2011, FERRARI 2012a/b, 2013, 2013; CARRRETERO GOMEZ u.a. 2017, VOUKARI u. a. 2016, 2022, LARRAZ 2013),

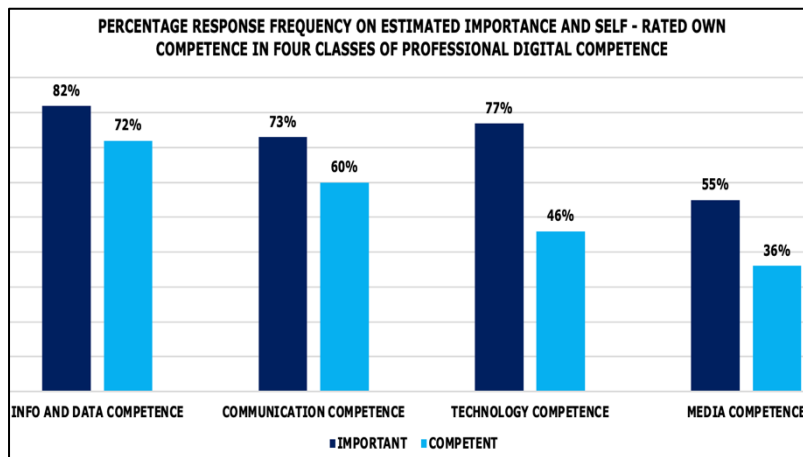
- **Information and data competence** (BMBWF 2018, DÖRGE 2015, LEICHNER 2015, SCHÖNBRODT et al. 2016, SCHÜLLER et al. 2021),
- **Media competence** (BAAKE (1996), GAPSKI (2009), BRANDTWEINER, DONAT & KERSCHBAUN (2010), SCHORB (2017), THOMAN & JOLLS (2003), TULODZIECKI (2011), VAN DIJK (2012))
- **Communication competence** (DÖRING 2003 und 2022, GRIMM & DELFMANN 2017, BAUER & MÜBLE 2020)
- **Technology competence** (SCHMIDT-HERTA 2014, STEMMANN 2016, TERRA 2022).

PDC referred to the use of digital resources in general, not to a specific professional context. PDC was about the 'digital craft box', such as the knowledge, operation and use of hardware and software, and about technical solutions for problems in dealing with digital resources. For example, media competence included the following elements:

- Understanding of digital content (understanding the meaning and impact of digital media and content, critical analysis of the content, evaluation of the content)
- Development and production of digital communications (selection of suitable digital resources, use of common application software, creation, design and presentation of data, information, content in various formats, distribution of content via various digital media)
- Knowledge, handling, and consideration of legal and professional ethical regulations, e.g. copyrights and licenses in the digital space
- Knowledge and application of programming techniques.

The empirical results supported the assumption that professional digital competence is relevant in school psychology practice.

The assignment of the questionnaire items to PDC can be found here: DiCoSP - STUDY APPENDIX 12.



**FIGURE 7** *Percentage response frequency on assessing the importance and one's own DC in professional digital competence classes, N=181*

On average, 72% of the respondents found the PDC classes important and 53% felt competent in them (Figure 7). Most respondents (82%) found information and data competence important in their professional practice, followed by technology competence (77%) and communication competence (73%). Most respondents (72%) also felt competent in the information and data class, followed by communication (60%), then technology class (46%). Least respondents estimated media competence to be important in their practice (55%) and felt media competent (36%). These results matched the finding that digital resources were used by most respondents in the work field of 'administration' and 'communication with target groups', while least respondents used digital resources in the work field 'intervention' and rarely digital interactive tools and formats were used, which requires more media competence.

Media and methodological competence are closely related as the creative and productive side of media competence requires knowledge and skills in particular in legal and digital-technical areas. SCHAFFAR (2019) described the also close connection between digital media competence, key competence, and learning: *"Media competence cannot be taught, but can only be acquired on your own... To be and remain media competent, you need to stay up-to-date, constantly inform yourself about new apps, trends or platforms and keep moving. This does not require fact-based knowledge, but rather knowledge that is based on dealing with processes and dynamics. To be competent in this area, people need to know how to cope with digital obstacles, need to navigate and be able to control themselves. Above all they need to be able to think independently. Since no one can predict future developments and twists by technological change, skills to deal with these changes are needed. This includes learning from mistakes, as well as remaining open for new things in the long term."* (SCHAFFAR 2019, p.313-315, free translation)

## 4. KEY COMPETENCE

The key competences selected in research were considered to be essential non-job-specific competences for working in the digital age, such as creativity, the ability to cooperate, etc. (DELOITTE 2017, DÖRGE 2015, FUCHS &

ROGMANN 2012, GRAF 2020, VAN LAAR et al. 2017, ZINKE 2019). According to SCHARNHORST (2018), key competences are not clearly defined, so that there could be overlaps between key competences and digital-related technical, methodological, social and, above all, personal competence. It depends on the user's interest which assignment should be given priority in the digital competence framework. For example, if the strategic goal of a school psychology service is to strengthen the workforce's willingness to use more digital resources, joy of innovation can be seen as a key competence in all PMSP - classes. If an SP has for the first time in her professional practice the goal of developing podcasts on relevant school psychology topics for teacher training courses, this willingness to innovate can be seen as an attitude of her digital related self – competence.

There have been several studies on the systematization of the inflationary concept of 'key competences' (ARNOLD 2014, BECK 1995, BUNK 1990, JÄGER 2001, LAUR-ERNST 1996, LEHMKUHL 1994, MERTENS 1974, ORTH 1999, REETZ 1999b, RYCHEN & SALGANIK 2003) and on the meaning of key competences in the workplace under digital conditions (GRAF 2020, HEYSE et al. 2014, 2015, 2019, MERTENS 1974, OBERLÄNDER 2019, SCHARNHORST 2018, COUNCIL OF THE EUROPEAN UNION 2018, ZINKE 2019). In the DiCoSP study, the key competences of the evidence based Code®CompetenceAtlas according to HEYSE and ERPENBECK (2017) were adapted to existing education and training plans as well as professional requirement profiles for (school) psychologists, so that the DiCoSP model was based on the following relevant set key competences for digital-related work in school psychology practice (FIGURE 8):

**FIGURE 8** Model of the Code®CompetenceAtlas adapted to school psychologist's profiles

<b>CODE COMPETENCE ATLAS ADAPTED TO PROFESSIONAL PSYCHOLOGICAL PRACTICE</b>					
<b>SOCIAL COMPETENCE S</b>					
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
<b>PROFESSIONAL AND METHODOLOGICAL COMPETENCE PM</b>					
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-oriented leadership	Teaching Skills	Perseverance	
Professional recognition	Consequence/risk awareness	Goal-oriented action/ Determination	Market knowledge	Diligence	
<b>PERSONAL COMPETENCE P</b>					
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 inovation	Design thinking	Loyalty	
Decision Making skills	Holistic thinking	Initiative/ Entrepreneurship	Reliability	Credibility	



The assignment of the questionnaire items to key competences can be found at DiCoSP - STUDY APPENDIX 20. Table 5 shows response results to items that represented key competences in the questionnaire.

The empirical results supported the argued assumption that in the DiCoSP competence model key competences needed to be considered as an important component of DC in school psychology practice.

While most key competences of the 21st century, such as self-efficacy, self-organization, managing complexity, dealing with ambiguity, willingness to learn, were estimated to be important by a very high percentage of respondents (on average 88%). There was some heterogeneity in the assessment of self - rated own key competences (83% on average): agility (59%) (DWECK 2007, HOFERT 2018) and technical affinity (57%) were mentioned less frequently (Table 5).

**TABLE 5** Percentage response frequency on items to measure key competences related to their importance for professional practice and self – rated competence, N=181

Item	Content	Important = %	Competent = %	Key Competence
G20000 5 SQ001	I am willing to actively engage in change (e.g., offer an online calendar for meeting appointments)	89%	82%	<del>Openness</del> to change
G20000 5 SQ002	I can deal with complexity, e.g. by alternating synchronous/asynchronous or online/offline work	89%	85%	<del>Resilience</del> , coping with complexity
G20000 5 SQ003	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 <del>ambiguity</del>
G20000 5 SQ004	I am good at prioritizing when dealing with a flood of emails	98%	90%	<del>Decision making</del> skills
G20000 5 SQ005	I can organize myself well in the face of increasing flexibility in working hours and jobs	98%	93%	Self-organization
G20000 5 SQ006	I manage to establish a personal relationship even in digital communication	97%	94%	Ability to <del>relate</del>
G20000 5 SQ007	I like to learn new things	98%	96%	<del>Willingness to learn</del>
G20000 5 SQ008	I can think agilely, for example, by making suggestions to my employer on how to digitally improve the service offering	73%	59%	<del>Agility</del>
G20000 5 SQ009	During the school shutdown, I took responsibility for a digital way of working despite many concerns,	93%	88%	Personal responsibility
G20000 5 SQ010	I am confident that I can effectively apply digital resources in my job	89%	88%	Self-efficacy beliefs
G20000 5 SQ011	I like to deal with technical devices	66%	57%	Affinity for technology
G20000 5 SQ012	I <del>make an effort</del> to analyze difficulties encountered online, find an improvement and try it next time	83%	80%	<del>Result-oriented</del> , <del>planful</del> action
G20000 5 SQ013	I <del>am able to</del> address constructively problems and conflicts in my professional	83%	79%	Conflict resolution skills
G2Q00 003 SQ14	I <del>am able to</del> consider my own digital wellbeing, e.g. by setting limits between work and private life	96%	87%	Well-being
Mean		88%	83%	



The high percentages for most key competences suggested that the surveyed SPs had good prerequisites for being able to deal resiliently with DT in their professional practice.

## **5. PRACTICAL RELEVANCE OF THE STRUCTURE OF THE DiCoSP COMPETENCE FRAMEWORK**

**1.DC is an important determinant of digital-related working methods in school psychology.** A statistically significant relation was found between the assessment of the importance of DC and the frequency of use of digital resources, whereby an assessment as important was associated with more use of digital resources (DiCoSP - STUDY, APPENDIX 23 SIGNIFICANCE TEST 3 and 38). These findings supported the hypothesis that DC is an agent of cultural transformation in school psychology work.

**2.Transversal key competences are an important component of DC in school psychology practice.** The integration of non-job-specific key competences as part of digital school psychology competence was justified, among other things, by the finding a statistically significant relation between key competences, DC, and the attitude towards DT. For example, more technology-savvy respondents than non-technology-savvy respondents seemed to have knowledge of electronic testing procedures (DiCoSP - STUDY, APPENDIX 23 SIGNIFICANCE TEST 42).

**3. School psychology work fields are a necessary frame of reference for comprehending DC in school psychology practice.** Statistically significant differences were found in the assessment of the importance of DC and the use of digital resources between school psychology work fields (DiCoSP - STUDY SIGNIFICANCE TEST 1 and 2). While in the field of 'counselling' and 'collegial cooperation' the expectations regarding the impact of DT on school psychology were significantly related to the use of digital resources, this was not the case in 'assessments' (DiCoSP - STUDY SIGNIFICANCE TEST 24.25-27). It could be assumed that more SPs used digital resources in collegial collaboration and counselling if they viewed DT as an enrichment of school psychology than if they expected no impact or an impoverishment of school psychology.

**4.DC is a necessary but not sufficient condition for the use of digital resources.** 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 in school psychology practice were influenced by social circumstances, expectations of effort and performance (added value) and facilitating conditions.

## □ SOCIAL FACTORS

A statistically significant relation was found between **“culture”, “attitude towards DT”** and **“use of digital resources”**, e.g. in digital collegial collaboration (see also Table 7).

**TABLE 6:** *Percentage frequency distribution of responses to ITEM G5Q00004 in regard to the impact of DT on school psychology per country*

<b>G5Q00004 I believe digital transformation will change school psychology..../ ITEM G2Q00006 Country of employment</b>	<b>AT N=27</b>	<b>BE N=12</b>	<b>CH N=37</b>	<b>DE N=101</b>	<b>Σ=177</b>
<b>Enrich</b>	<b>85%</b>	<b>92%</b>	<b>65%</b>	<b>89%</b>	<b>84%</b>
<b>Hardly change/diminish</b>	<b>7%</b>	<b>8%</b>	<b>35%</b>	<b>11%</b>	<b>16%</b>
<b>ITEM G2Q00004SQ012 Percentage of respondents, who Use digital resources occasionally/frequently in collegial collaboration</b>	<b>100%</b>	<b>100%</b>	<b>82%</b>	<b>98%</b>	<b>95%</b>

Statistically significantly more Swiss than German respondents believed that DT would hardly change or would impoverish school psychology in some areas (Table 6). Accordingly, a statistically significant relation was found between the country of work and the use of digital resources in collegial collaboration. It could be assumed that more Swiss SPs than German and Austrian SPs did not use digital resources or used them only occasionally in collegial collaboration (DiCoSP - STUDY, APPENDIX 23, SIGNIFICANCE TEST 52). This result also 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.

No statistically significant relation could be found between the SP's attitude towards DT and the following sample characteristics

- Gender
- Age
- Seniority
- Part/full-time employment
- Management function yes/no
- Urban-rural environment
- Place of work in primary/secondary schools; Place of work in school psychology service outside of school.

## □ EFFORT AND PERFORMANCE EXPECTATIONS (ADDED VALUE)

The assessment of the importance of collegial online working groups compared to offline groups (Item G5Q00002) showed that round about half of surveyed SPs only supported digital collegial collaboration under the

condition that travel times could be saved, i.e. from the perspective of effort expectation according to the UTAUT theory (Table 7).

ITEM	...just as valuable as offline encounters].	...a complement to offline encounters	good to	...a stopgap solution, personal contact is always preferable	...only useful when colleagues are geographically distant.
G5Q00002SQ001 To what extent do you agree or disagree with the following statements "Online encounters with colleagues are..."? N=181					
Completely/rather agree	35%	85%		41%	57%
Completely/rather disagree/undecided	65%	15%		59%	43%

**TABLE 7** Percentage response frequencies to ITEM G5Q00002 to analyze attitudes towards remote work in collegial collaboration

The result on the frequency of using digital resources for one's own training (Table 8) was consistent with the

impression that dealing with digital topics was viewed from the perspective of added value. Around six times more respondents who viewed DT as an enrichment for school psychology used digital resources in their own training than respondents who expected no change or impoverishment in school psychology as a result of DT (14%:80%).

**TABLE 8** Percentage response frequency on the use of digital resources depending on the assessment of the impact of DT on school psychology

G5Q00004 I believe digital transformation will transform school psychology.... G2Q00004... How often do you use digital resources in the...? N = 185	FREQUENT USE OF DIGITAL RESOURCES	OCCASIONAL USE OF DIGITAL RESOURCES	NO USE OF DIGITAL RESOURCES
G2Q00004SQ016 COLLEGIAL COOPERATION Stagnation/decrease of school psychology. Enrichment of school psychology	Collegial Collaboration 7%	Collegial Collaboration 7%	Collegial Collaboration 2%
G2Q00004 SQ012 ASSESSMENT Stagnation/decrease of school psychology Enrichment of school psychology	ASSESSMENT 4%	ASSESSMENT 4%	ASSESSMENT 8%
G2Q00004SQ0001 COUNSELING Stagnation/decrease of school psychology of school psychology. Enrichment of school psychology	COUNSELING 2%	COUNSELING 10%	COUNSELING 4%
G2Q00004SQ0009 OWN TRAINING Stagnation/decrease of school psychology Enrichment of school psychology	OWN TRAINING 5%	OWN TRAINING 9%	OWN TRAINING 2%
	43%	37%	4%

## □ FACILITATING CONDITIONS

There were no statistically significant country-specific differences in regard to the estimated importance of DC in the field of assessments (Table 8). In contrast, a significant relation was found between the country of employment and the use of digital resources in assessments (DiCoSP - STUDY APPENDIX 23 SIGNIFICANCE TEST 14 and 40). It could be assumed that more Swiss than German and Austrian respondents used digital resources in assessments. While a statistically significant relation was found between

the attitude towards DT in school psychology and the frequency of use of digital resources in counselling (DiCoSP - STUDY, APPENDIX 23 SIGNIFICANCE TEST 27,29,34), the empirical findings suggested that the attitude towards DT in assessments did not play a relevant role for the use of digital resources (DiCoSP - STUDY, APPENDIX 23 SIGNIFICANCE TEST 25, 41,44): While, for example, in most work fields, a positive attitude of the SP towards DT was significantly related to increased use of digital resources ( DiCoSP - STUDY,, APPENDIX 23 SIGNIFICANCE TEST 24,27,29,34), this relation did not apply to test diagnostics (DiCoSP - STUDY, APPENDIX 23 SIGNIFICANCE TEST 25,41). 34% of surveyed SPs who found digital change enriching did not use digital resources in assessments, while in most other work fields this percentage was below 12% (Table 8). The question therefore remained as to which conditions contributed to the result that more surveyed Swiss SPs used digital tools in assessments than SPs from other countries.

**TABLE 9** *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 electronic 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 infra structure with specific software, as licenses for electronic tests N=174
<b>AT</b>	56%	47%	67%	19%	59%	23%
<b>BE</b>	25%	83%	50%	25%	84%	0%
<b>CH</b>	46%	72%	72%	57%	75%	54%
<b>DE</b>	48%	58%	58%	20%	50%	32%

In an international comparison ([IMD World Digital Competitiveness \(WDC\) Ranking](#)), the CH was best equipped digitally and also performed best in the DICOSP results on the equipment of school psychology services with specific software and the frequency of use of virtual tests (Table 9). A statistically significant relation was found between the use of electronic tests and the availability of subject-specific software (DiCoSP - STUDY APPENDIX 23 SIGNIFICANCE TEST 43). More Swiss than German respondents were better equipped with specialist software and also more Swiss than German respondents used digital resources in assessments.

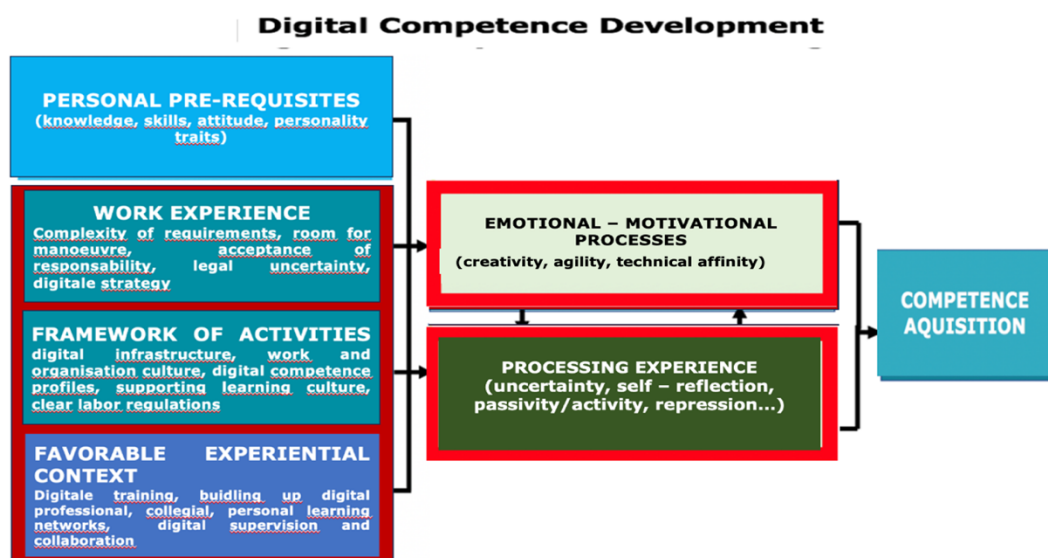
Based on the empirical findings, it could be concluded that the use of digital resources in assessments was statistically significantly related to the digital equipment of school psychology services. This result justified the consideration of the work context in a digital competence framework and confirmed the assumption of FRANKE (2005) and VENKATESH (2003), also

for SP, that facilitating workplace conditions are a determinant of digital competence acquisition or the use of technology.

## 6. DIGITAL COMPETENCE DEVELOPMENT IN SCHOOL PSYCHOLOGICAL PRACTICE

To check whether the DiCoSP digital competence framework captured determinants of digital competence acquisition, the responses of SP in AT, BE, CH, DE to the DiCoSP online questionnaire were analyzed regarding the need, importance and self-assessment of DC, digital usage behavior and the digital-related work context. The **FRANKE model** provided a structure for analysis (Figure 9). The red-framed boxes indicate key variables for the acquisition of digital skills by SPs in the countries examined based on the survey results:

**FIGURE 9** Own illustration of Determinants of Competence Acquisition in School Psychology, Source: FRANKE 2005, p.56



### 6.1. PERSONAL PREREQUISITES

The empirical results suggested that most surveyed SPs, in their own opinion, had sufficient personal pre-requisites to be able to cope with the digital challenges of their job in a resilient manner as required:

- ☐ 83% considered DC to be important in their job (ITEM G2Q00001);
- ☐ 95% used digital resources daily for work (ITEM G2Q00002);
- ☐ 82% rated themselves as digitally competent or as digital experts (ITEM G2Q00006);
- ☐ 83% on average believed they had the necessary key skills for the 21st century (ITEM G2Q00005);

- 84% of respondents believed that DT will enrich school psychology (ITEM G5Q00004).

However, only around half of the surveyed SPs had basic knowledge of DC and skills in methodological competence as well as media-reflective self-competence.

## 6.2. FRAMEWORK CONDITIONS OF THE ACTIVITY

Two thirds of the respondents estimated that their work environment had adapted to digital change, with 100% of Belgian, 72% of Swiss, 64% of German and 46% of Austrian respondents agreeing. While most of the surveyed SPs had good equipment at their workplace (hardware and software equipment, PC workstations, IT maintenance and care), on average around a third found the staff's IT support to be inadequate. 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 and in schools as well as inadequate equipment with specific software. Austrian respondents were more likely to see a less digitally adapted infrastructure than respondents from the other three countries, with 62% criticizing inadequate digital infrastructure, 81% criticizing the WLAN connection in the workplace and specialist software equipment and 55% criticizing IT support in the workplace (Table 10).

In no country examined there was a nationally binding regulation on the digital-related working methods of SP's, so that, for example, data protection in school psychology was largely subject to general data protection law. Overall, the development of labor law in the face of DT was still in its infancy in German-speaking European countries (DÄUBLER 2022).

**TABLE 10** *Percentage response frequency on ITEM G6Q00002 on poor infrastructure of SP's workplaces N = 173*

Evaluation of digital equipment as poor	Hard-Software Equipment	and Availability of PC workstations	User specific software licenses as for electronic tests	with User support	WLAN connection at workplace	WLAN connection in schools
AT	34%	8%	62%	55%	81%	42%
BE	8%	0%	58%	58%	16%	42%
CH	22%	13%	35%	30%	35%	30%
DE	24%	6%	49%	25%	58%	58%

The gap between too general and a lack of specific law caused labor law uncertainty, which was reflected in perceived hurdles to a digital way of working: around 40% of the surveyed SPs saw the infrastructural framework as a barrier to the SP's digital-related working methods, around



20% saw barriers in unclear employment regulations and data protection issues and around 10% in a lack of management support (Tables 11 and 12).

**TABLE 11** *Percentage response frequency on barriers to remote work (ITEM G4Q00001)*

<b>G4Q00001 What are the stumbling blocks for you in your usage. digital tools? N=184, multiple answers possible</b>	<b>Percentage of responses</b>	The
<i>Lack of appropriate framework (infrastructure, equipment) (SQ008)</i>	41%	
<i>I can benefit from the use of media, but my priorities are elsewhere (SQ003)</i>	32%	
<i>None, the use of digital media is an integral part of my work (SQ001)</i>	31%	
<i>I lack the technical know-how (SQ007)</i>	25%	
<i>I have concerns for privacy reasons (SQ006)</i>	22%	
<i>The legal situation is unclear for SP (SQ015).</i>	21%	
<i>My working time is not enough for this (SQ011)</i>	19%	
<i>I would like to use more media, but don't dare to do it by myself (SQ004)</i>	13%	
<i>My superiors do not strategically support digital media use (SQ012)</i>	12%	
<i>There is no interest from my target group (SQ005)</i>	6%	
<i>I don't want to enter a field of work that overwhelms me with its fast pace and complexity (SQ009)</i>	6%	
<i>Someone else in my service is responsible for digital media outreach (SQ014)</i>	6%	
<i>Digital work is socially unfair (SQ010)</i>	4%	
<i>Other</i>	4%	
<i>The use of media does not provide added value (SQ002)</i>	3%	

answers revealed a dilemma in digital-related school psychology practice between pressure to adapt and indecision. Inadequate digital organizational structure resulted in a search for legal certainty in a marshalling yard of responsibilities and a feeling of powerlessness due to a lack of room for maneuver. The complex challenges of digital change had also caused uncertainty at the management level of school psychology services, especially at the time of the Covid 19 pandemic. As an example from the DiCoSP questionnaire, a comment from an SP in a managerial position: *"For me, a big challenge is to find the right balance between digitalization and "classic working methods" in order not to overwhelm employees, and also to ensure data security."*

Al-Baba (2022) cited similar comments in her study of British SPs' digital-related work: *"SPs reported that management was a barrier to the use of IT in their practice. SPs felt that this was because IT was not being prioritized and the focus was instead on meeting legal obligations essential to the survival of services... Another issue was... that IT planning was not strategic... IT was seen as an "add-on" designed to be "cost-effective" rather than functional."* (AL BABA 2022, p.110)

The DiCoSP results on knowledge of the legal situation in connection with digital-related work showed the frequent discrepancy between the assessment of the importance of the DC and self-assessed own DC:

- 79% valued knowledge of professional and legal standards in order to ensure the quality of their digital services, 38% felt competent in this (ITEM G2Q00003SQ022);
- 71% valued knowledge of digital copyrights and licenses, 28% felt competent in it (ITEM G2Q00003SQ010).

The discrepancy was not trivial and required school psychology as a profession to clarify how a balance between law, ethics and technology can be explored (SMITH HARVEY & CARLSON 2003, FLORELL 2015, NEWMAN et al. 2019, STIFEL et al. 2020, SONG et al. 2020 ). The development and communication of norms and legal bases to be able to offer SP professional security was an important prerequisite for digital-related working methods and was seen in the literature as a way to overcome social and professional problems through digitalization (NEWMAN et al. 2019, PORTER & STERN 2015). NEWMAN et al. (2019) pointed out the strengthening power of value orientation for SP 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)

Around a third of the surveyed SPs indicated an interest in acquiring knowledge on labor law issues in DT. The following questionnaire comments illustrated the professional problems of adapting to digital change and how closely DC and the development of a digitally competent organization are interlinked:

*"For psychologists confidentiality must be above all and appropriate open-source, data protection-friendly and data-saving software must be used. However, I often experience a great willingness to invest in data-hungry solutions because there is a lack of IT expertise in the country. In data protection cases you "need someone to sue". This is toxic for psychologists, especially if digital competence remains limited to software use... I see the task of psychologists in insisting 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 counselling, online supervision, and online training are all easily possible via Skype for Business, as the IT technology is set up on a state-owned server. Data protection concerns and the unsuitability of a tool for continued professional training or supervision are brusquely ignored."*

*"The change would also have to take place across all levels, especially in the use of digital possibilities to improve communication, knowledge management and cooperation! At the moment there is a lot expected from us SPs at the grassroots level, but little change in the way we work from top down."* (free translation)

### 6.3. EMOTIONAL-MOTIVATIONAL PROCESSES

Asked about the drivers of remote working in school psychology practice, two thirds of the answers referred to a more reactive than creative-productive attitude of SP towards DT (Table 12).

**Table 12** *Percentage of response frequency on drivers of DT in school psychology*

<b>G4Q00002 Which factors have supported the increase of DT of EPs' workplaces in recent years? N = 181</b>	<b>Percentage of responses</b>
<b>Reactive attitude</b>	
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	52%
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%
None, the use of digital media has not been promoted.	5%
<b>Active attitude</b>	
Digital work is fun and opens up new work and design opportunities	30%
Positive examples of remote work were motivating	22%

This result was consistent with the finding that the fewest respondents felt they were competent in the key competence of agility. Little agility and a reactive attitude towards DT could be a consequence of labor law uncertainty (HOFFMANN-RIEG 2021, LÜHR et al. 2020). SP themselves pointed out the importance of agility: *"An agile mindset could help us become more open to new opportunities and not only explore and use them when we are forced to do so by external circumstances."* (BACHMANN et al. 2021, p.6)

### 6.4. FAVORABLE CONTEXT OF EXPERIENCE – CONTINUED PROFESSIONAL TRAINING

Depending on personal needs, digital learning can in principle be carried out anywhere at any time, so that physical rooms are no longer absolutely necessary for learning. This flexibility facilitates participation and exchange by loosening the boundaries of formal and informal learning, especially for working people whose time for continued professional training is limited by

a variety of tasks and labor regulations (BRIEN & HAMBURG 2014). A good example are the webinars organized by the International School Psychologists Association (ISPA), in which SPs all over the world exchange ideas on specific topics. This bottom-up approach changes historically grown education and training hierarchies. An example comment from the focus groups: *"Yes, if I can watch this in a webinar and I'm at home, then I have all the options and then I can take part and if I have to drive somewhere, then I have to find a compromise between my family and my other activities."*

<b>13a ITEM G3Q00001 Where did you acquire DC to which extent? N=181</b>	<b>% most/all</b>
Independent Learning	66%
Workplace	63%
Privat environment	62%
University	28%
Facilities for Continued Professional development	18%
School	8%

<b>13b ITEM G3Q00007 How do you rate the offer for continued professional DC trainings in your work environment? N=187</b>	<b>%</b>
Surplus	1%
OK	19%
Rather poor	43%
Not existent	16%
I don't know	21%

**TABLES 13** *Percentage response frequency on SP's place of DC acquisition and access to continued professional trainings for DC*

<b>13c ITEM G6Q00004 Which Online- or Offline training offers are accessible for you if you like to improve your DC? N=181</b>	<b>% Responses</b>
At work place	57%
Authority ( e.g. Ministry of Education) exclusively for SPs	38%
Private Providers	35%
Professional organisation/specialized societies	25%
Authority for multi professional groups	24%
Universities	16%
Training courses that allow qualifying with a license/certificate of DC	12%

By far most of the surveyed SPs had acquired their DC independently or in a private setting or at work (Table 13a). Around a third acquired DC at university, 18% in education and training. For most respondents, continued professional DC development (Table 13c) was available within the context of their workplace, for around a third through private providers, and for a quarter through professional organizations or specialist societies. Continued professional training at universities was only accessible for 16% of respondents. 12% had access to continued professional training courses with DC licensing. This training offer was rated as inadequate (rather inadequate/non-existent) by 59% of the surveyed SPs. 21% were unable to evaluate the offer (Table 13b). It was therefore likely that better information about training opportunities and a greater range of offerings tailored to needs could improve digital competence acquisition among SPs.

The analysis of learning formats (Table 14) to acquire DC made it clear that SPs preferred formats with a maximum of autonomy and found them helpful, such as learning by doing at work (54%), informal support from friends, family, and colleagues (42% ), online tutorials (39%), surfing the Internet (26%). Other studies on the acquisition of DC by SPs also came to similar results (VAN DEURSEN 2014, FACER & FURLONG & SUTHERLAND 2001, SELWYN & GORARD & FURLONG 2006).

**TABLE 14** *Percentage response frequency for item G2Q00005 on DC training formats***ITEM G3Q00005 Which of the DC training formats you used did you find helpful in your professional practice? (N = 181)**

Learning by doing at workplace (SQ008)	54%
Informal support by friends/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%
Interactive webinar by and with SP (SQ016)	17%
Listening to professional Online-presentations (e.g.. via Podcasts) (SQ005)	17%
Online learning group with colleagues/SPs on digital working in a professionally relevant problem situation (SQ014).	17%
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)	13%
Following scientific blogs. forums, Twitter, Facebook pages of various professionals (SQ006)	12%
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%

The usage habits of digital tools (Table 14) suggested that only a few surveyed SPs used and perhaps knew digital formats supporting their own competence acquisition and knowledge management (e.g. individual online network 3%, online learning group with colleagues about remote work in professionally relevant situations 13%, modular online self-learning program 14%). The study by SPILT et al. (2021) on the professional profile of Belgian SPs also found that only a few SPs (9%) used scientific blogs for further training. In view of the lack of time and limited continued training possibilities, a greater use of learning communities (communities of practice) for SP, for example, represents a favorable context of experience so that a professional culture can be developed by collegial exchange integrating remote work in a useful and meaningful way (LAVE & WENGER 1991, WENGER 2005, REINMANN-ROTHMAIER 2000). A good practical example is [edpsy.org.uk](http://edpsy.org.uk), a British exchange platform for SP.

The interest of the SPs surveyed in acquiring digital skills was relative:

- Around 10% of the surveyed SPs had no need for further training on DK (ITEM G3Q00003);
- Around a third saw value in remote work, but considered other professional activities to be equally or more important important (ITEM G4Q00001SQ003);
- Over half of the respondents found topics other than DC more interesting for their continued professional development (ITEM G3Q00006). Interesting training courses on DC for SP related to current professional issues, such as relationship management in online counselling (52%);
- Around two thirds of the respondents had received continued professional DC training in the last two years, while 39% had not taken part in any further DC training (ITEM G3Q00004);

- The most frequently cited obstacles to participate in continued professional training are a lack of time (65%) and a lack of information (63%) about the existing offering or the skills to be acquired (G3Q00003).

Acquiring DC seemed to play a role especially when remote work promised added value compared to the traditional way of working in order to overcome current professional challenges (see also UTAUT theory). A typical comment from one respondent: *"I would need on-the-job training more depending on the situation and the occasion."* In this respect it could be concluded that

- individualized, informal, and self-directed digital learning formats with direct relevance to professional practice,
- better information about the significance of DC in school psychology as well
- better information about needs-oriented digital training opportunities can have a beneficial effect on the acquisition of DC.

These results proposed a mediation strategy for the implementation of the DiCoSP competence model that adapts digital knowledge, skills, and attitudes to the primacy of current professional challenges in such a way that professional added value can be created for SP and their services. This conclusion was based on the argued assumption that DC is situation and context specific.

## 6.5. PROCESSING EXPERIENCE

The seven phases change management model according to STREICH (1997) (Figure 10) was suitable for structuring the questionnaire results for processing DT experience in school psychology practice (DiCoSP STUDY, ASSIGNMENT OF THE DiCoSP - QUESTIONNAIRE RESULTS TO THE PREICH MODEL IN APPENDIX 23, TABLE 48).

According to this model, around 16% of respondents rejected a digital-related way of working in school psychology practice (phases 1 and 2: shock phase, defense, and rejection). The majority of around 54% were assigned to phases 3 to 5, which involved trying out, increasingly collecting, processing, and developing new information. Contributions from the expert focus groups illustrated this phase:

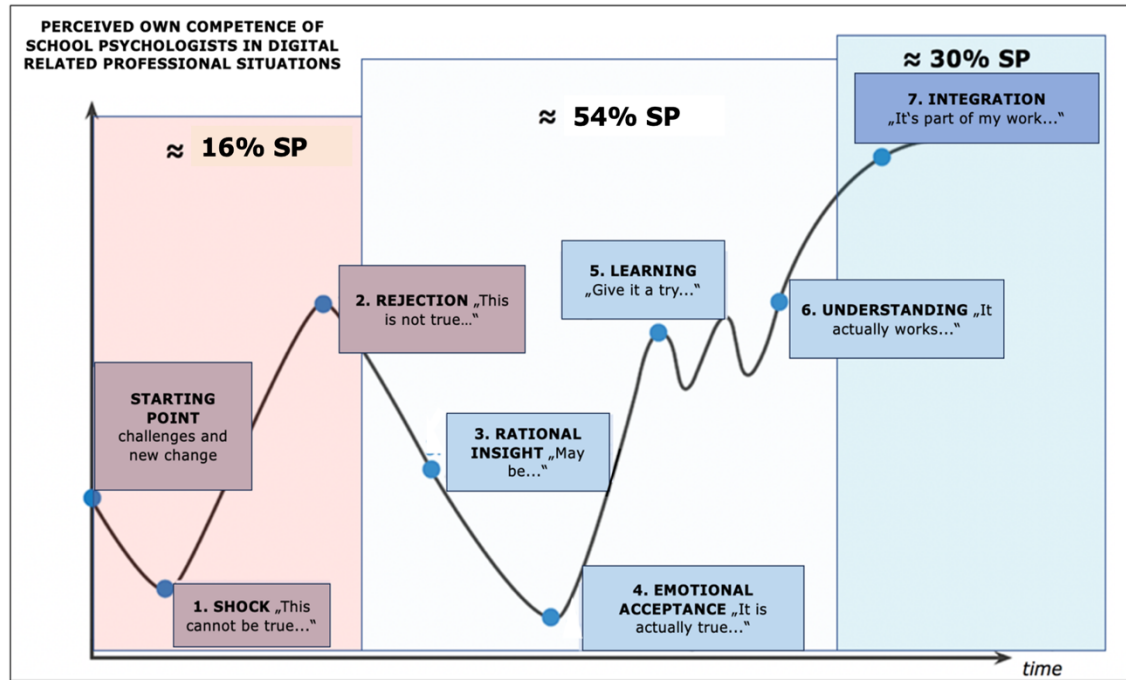
*"...maybe you just have to travel along to see where the journey takes you in the end and really try it out and have a certain tolerance for mistakes or admit it to yourself in order to know where you're going and what you can learn along the way."*

*"But using spaces and learning what you can do better, I think that's something which needs spaces for encouragement and also assurance that we protect them"*



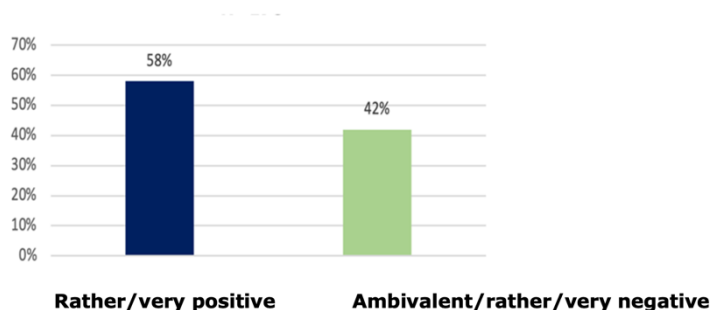
well with supervision and similar mechanisms so that no one will fail with an experiment.” (free translation)

**FIGURE 10** Processing DT in school psychology practice according to the Seven Phase Model of STREICH (1997)



Despite the positive prerequisites, around half of the respondents' experienced uncertainty about the significance of DT in professional practice. 46% were either unsure about the importance of DC or about the increasing use of digital resources. 58% of respondents perceived the increasing digitalization in school psychology positively, but 42% perceived DT negatively or ambivalent (Figure 11).

**ITEM G5Q00001** How do you personally perceive the increasing use of the Internet and digital media in SP? N = 178



**FIGURE 11** Percentage response frequency on personal perception of the increasing use of digital media in school psychology (ITEM G5Q00001)

Throughout the DiCoSP questionnaire an inconsistency between a positive attitude towards DT on one hand and uncertainty in the assessment of DC importance or of the increasing use of digital resources on the other hand

could be observed in almost half of the respondents. According to the STREICH model this inconsistency could be seen as a typical sign of the fourth phase, which it is about the emotional processing of DT in professional practice. This process was accompanied by a series of cognitive dissonances, e.g.

- 34% of the respondents valued DC but were unsure or opposed to the use of digital resources in their professional practice;
- 42% of the respondents were skeptical about the increasing use of digital resources in school psychology, but 76% used digital resources on average in 17 fields of action;
- 81% of the respondents valued knowledge of technical solutions to protect confidentiality in digital advice, 39% considered themselves competent and
- 79% valued knowledge of professional and legal standards in order to ensure the quality of their digital services, 38% felt competent in this, although 92% used digital resources in advice.

A successful emotional acceptance of DT paved the way for the seventh phase, in which around a third of the respondents had integrated remote work into their professional practice.

In summary, it could be concluded that the DiCoSP competence framework was a useful source of information to map the digital competence development of SP's. The acquisition of DC seemed to be slowed down by uncertainty in labor law, a lack of digital framework conditions in the workplace and an insufficient favorable experience of remote work, so that the attitude of at least half of the surveyed SPs was characterized by a rather reactive behavior, uncertainty, and a rarely self-reflected remote work. According to their own assessment, most surveyed SPs had sufficient personal prerequisites to be able to deal with DT resiliently.

## **7. DIGITAL CHALLENGES IN SCHOOL PSYCHOLOGICAL PRACTICE**

### **7.1. MEDIA-REFLECTIVE SELF-COMPETENCE**

[EFPA's ethical MetaCode](#) requires psychologists to practice with integrity by ensuring and maintaining high standards of competence in their work and by recognizing the boundaries of their competences and expertise. This corresponded to WENZEL's (2015) comments on the media-reflective expertise of the consultants. *"The integration of electronic media into everyday consulting is a very complex process, which is designed in such a way that interested and curious consultants 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 professionals have media-reflective expertise..."* (WENZEL 2015, p.48)

Item "G2Q00003 SQ016 *I self-critically reflect on my own digital practice and actively develop it further*" concerned this media-reflective self-competence of the SP, which was classified in the DICOSP competence framework as the attitude basis of self-competence and also as a key competence of "ethical-normative orientation". While 82% of the respondents considered the reflection on and the development of their own digital practice as important, 56% felt able to do so. Given the professional ethical obligation, the discrepancy confirmed WENZEL's conclusion that media-reflective expertise is still a challenge in practice, even for SP. Since self-reflection is a necessary part of acquiring DC, especially by self-directed learning (DEHNBOSTEL 2003, DEWEY 1986, DILGER 2007, GRAF U.A. 2020, SCHÖN 1983), professional ethical questions arose when almost half of the respondents did not consider themselves competent to reflect critically and develop their remote work further. This result indicated the processing of DT experience in professional practice, which corresponded to phase 4 in the STREICH model.

The fewest respondents felt competent in the knowledge base of the PMSP – competence classes as well as in a digital expert role. Advanced digital method and media competence, including media-reflective self-competence, was less frequently present among the respondents than their estimated importance for school psychology practice indicated. These results gave rise to critical questions: Under which conditions do SPs use digital counselling? Who is responsible for technical problem solving in counselling situations? If SPs are not responsible for technical problem solving, how is the cooperation between SPs and those responsible for technology in counselling situations regulated? Given the high importance of confidentiality and professional integrity in psychological practice, the findings on uncertainty and inconsistency in the SP's remote work indicated the need for professional policy action. Solution strategies should be developed to ensure competent digital-related work in school psychology practice.

## **7.2. ACTIVE DESIGN OF DT IN SCHOOL PSYCHOLOGY PRACTICE**

About 40% of the surveyed SPs were unsure or negative when assessing the benefits of collegial online working groups compared to offline working groups (Table 7). Therefore, it could not be expected that interactive digital resources were used by more than 60% of the SPs surveyed. The respondents' usage habits of digital tools suggested that SPs only used and perhaps knew a limited number of collaborative online formats for their own skills acquisition and knowledge management (Table 16). SPs used digital resources more in the classic ICT sense as a means of information and communication, especially in administration and communication with target persons ("Web 1.0"). They used digital resources less as an instrument for interactive, creative design, production, and distribution of school

psychology content as well as for interactive collaboration and intervention ("Web 2.0") (LAI & TURBAN 2008).

The questionnaire results on the use of digital tools (Table 15) showed that most respondents used them for professional information, communication and administration, but that digital resources were not used as an interactive work tool in professional collaboration (red CAPITAL LETTERS), such as tools for service and project planning in form of Microsoft Teams 44%, cloud storage such as Dropbox by 37%, collaborative writing tools such as Etherpad by 29% (G2Q00003 SQ008), blogs by 4%, Twitter by 2% of the respondents. In comparison, non-interactive digital tools such as Powerpoint, Prezi, PDF documents were used by over 80% and, probably 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 almost 90% of respondents, which was the case to a lesser extent before the pandemic (REUPERT et al. 2022).

**TABLE 15** Percentage frequency distribution of responses to item G6Q0003 Which of the following digital resources do you use in your professional practice?

G6Q00003 Which of the following digital resources do you use in your professional practice? N=181v	% = Yes		
Interactive tools, such as VR glasses	2%	CLOUD MEMORY	37%
Wearables	2%	Wikis - Wikipedia	39%
MICROBLOGGING - TWITTER	2%	WhatsApp, Snapchat	43%
BLOGS AND BLOGTOOLS	4%	Video formats - Youtube	43%
Photo networks - Instagram	6%	SERVICE PROJECT PLANNING SOFTWARE, SUCH AS MICROSOFT TEAMS	44%
Audio software	7%	Website own facility	58%
Software for image and video editing (e.g. Photoshop, Movie Maker)	8%	Smartphone	63%
SOCIAL NETWORKS - META (FACEBOOK)	9%	ORGANIZATION TOOLS, LIKE DOODLE	69%
Serious digital learning games	15%	PowerPoint, Prezi	84%
Electronic tests	27%	Digital texts, PDF docu	86%
Video Tutorials	30%	Zoom, Big Blue Button	89%
VOIP SERVICES	32%	Computer, laptop, tablet	96%
		Office software (Excel, Word)	96%

The AL BABA study (2022) found similar results about remote 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)

The HENNIGAN 2018 study also found that digital technology was primarily used for communication for administrative purposes while counselling students. "Many school counselors use technology to communicate with students for administrative purposes... , but this group does not appear to use it in their therapeutic work with students... This is surprising because young people regularly use technology for communication and social relationships (Mesch, 2012) and there is increasing evidence that they would be willing to use technology to support mental health if it were available..." (HENNIGAN , J. 2018, p.61 free translation)

This finding was in line with the DiCoSP results on the fewest use of digital resources in the work field of 'intervention' including digital interaction.

The task of strengthening methodological and media competence and thus also digital interaction represents an interface for the division of labor. DT is a complex challenge - not only for school psychology services - and cannot be overcome by SP alone. It requires multi professional and transdisciplinary collaboration as well as structured and lasting cooperation of both technical and informational, legal, social and communication science and (school) psychological competence (DIEFENBACH & HASSENZAHL 2017, MEZGER et al. 2000, MAIER et al. 2020, RITTERBAND et al. 2003, TOLKS et al. 2020). An according comment from the DiCoSP focus groups: *"If you want things to work, then you have to approach it in a multi-professional manner. You need someone who has the expertise in terms of content, but you also need someone who can integrate the good learning games to make such things appealing so that they are actually used. So this multi-professionalism is the big key, also in school and around school, so that things can work well."* (free translation)

Accordingly, it was suggested 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 having digital-related problems ('buddy system'/'digital scouts') and to expand digital-related supervision.
- to be able to ensure the quality of services by developing guidelines with a vision of school psychology's attitude towards DT and a design of school psychology's digital identity. Since the cultural aspect played a role in the attitude towards DT and digital usage, it would make sense to initially develop such a vision and guidelines on a national basis.

## 8. OUTLOOK

Based on the results of this study, five recommendations could be made for the future implementation of the DiCoSP digital competence framework in school psychology practice:

1. According to ROE (2002), creating a competence profile required the steps of career/job analysis, competence analysis, competence modeling, testing the competence model. The first two steps were the subject of this study, so that competence modeling (differentiation into digital competence 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 in a follow-up study to arrive at an empirically proven digital competence framework for school psychology practice.

2. The development of professional policy guidelines for remote work in school psychology, which pursues a creative, holistic approach in order to



be able to create school psychology identity spaces in the digital world, is a task both for SP themselves and for professional associations and employers of SPs. A comment from the focus groups: *"First of all, it's about attitude development. This means that you have to think about the question of where do we actually want to go? [...] that means that you actually need stopping points where you say, yes, I'm willing to go along with it and that makes sense and that doesn't make sense anymore."* It is important to promote innovations and improvements by 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 digital-related practice for orientation, as well as ethical-legal standards and decision-making models for ethical-legal dilemmas in digital-related working methods.

3. It is necessary to develop binding labor law regulations - also for SP - at the level of legislation, politics and employer organizations, as regulatory gaps with incomplete rules represent a brake on the development of remote work in school psychology (DONALDSON & DUNFEE 2008).

4. There was a need for SPs to acquire DC in practice (e.g. management skills and strategies for developing a digitally competent organization, digital-related knowledge, skills of digital-related methodological and media competence, development of networked digital learning communities, information on needs-based training offers, provision and enabling job-related, self-directed digital learning formats on current practice-related problems). This requires the development of an "enabling" learning and working culture. Within an organizational structure, DC can be supported, for example, by a firmly anchored "school psychology buddy system" that can support colleagues having digital-related needs and/or offer supervision.

5. The DT of school psychology practice cannot be managed by school psychologists alone. In order to develop meaningful and effective digital methods and 'products', multi professional and multi-disciplinary collaboration is necessary. The establishment of long-term structural cooperation communities would therefore be an important component of creative digital-related work in school psychology.

It is to be hoped that school psychology can create good conditions for dealing successfully with digital-related requirements in order to enrich the range of services for the benefit of target groups and SPs themselves. In this sense, a final quote from a DiCoSP survey participant:

*"The clients are mostly extremely well-versed in the digital world, so we simply have to be able to keep up with them - otherwise we will lose contact."*