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Measurement of media pedagogical competences of adult educators

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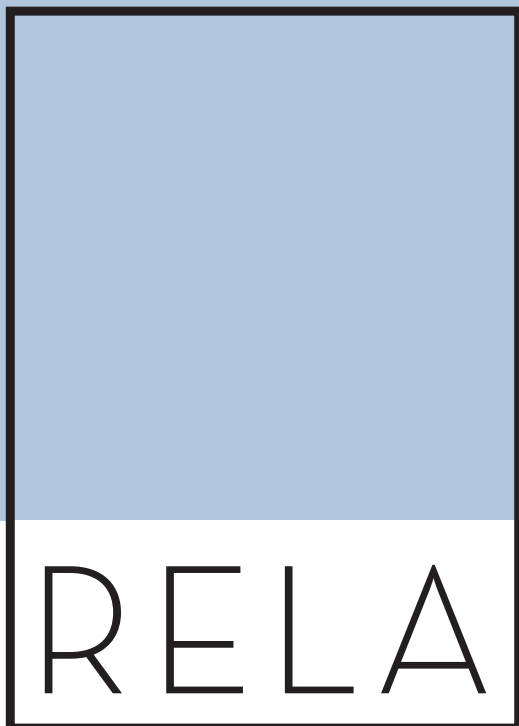
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- 307 Measurement of media pedagogical competences of adult educators
Matthias Rohs, Bernhard Schmidt-Hertha, Karin Julia Rott, and Ricarda Bolten

Measurement of media pedagogical competences of adult educators

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Abstract

Media pedagogical competence is critical for the modern-day adult educator. In the process of adult learning, both the use of digital media in the classroom and the transfer of knowledge in dealing with media are the basis for social participation and individual development that must be provided by teachers. However, at present little or no research has been conducted that assess media pedagogical competence of adult educators. Moreover, an instrument to measure media pedagogical competence was lacking. In order to redress these concerns, in the present paper an instrument for objectively measuring media pedagogical competence is designed and piloted with adult educators (n=622). The study provides the first results concerning objective measurement of adult educator media pedagogical competence.

Keywords: adult educators; digital media; media competence; test



Media pedagogical professionalization of adult educators

The importance of adult education for media literacy development

The European Commission (2015) has identified the use of new technologies as a key challenge for adult education is not only about fostering media competence, but also about media didactics: Media pedagogical competence of trainers is of particular importance. However, it must be noted that there is hardly any research on this topic. While in the contexts of schools and universities there is an intensive debate on the demands on teachers in the context of the digital transformation, this important debate has largely been ignored in adult education.

In this regard, there are a number of unanswered questions: Which media pedagogical competencies must adult educators have? How do these competencies differ from teachers in other areas of education? Are there also different requirements within adult education (e.g. between vocational and political education)? What media pedagogical competencies do teachers in adult education have? And, How do adult educators learn media pedagogical competencies? Only by answering these questions is it possible to develop guidelines for media pedagogical competence standards and quality assurance in this field.

Within this article, we will first examine the question of what media pedagogical competencies must adult educators have. Following, the results of a self-assessment by adult educators is presented. The results provide initial indications of how media pedagogical competences could be developed among adult educators.

Professionalisation of adult educators

Professionalisation of adult educators varies greatly from country to country (Egetenmeyer, Schmidt-Lauff, & Boffo, 2017). Moreover, there are hardly any quality standards in this area. Therefore, a number of projects have been initiated for several years at national and international level to develop common qualification standards for professionals in adult education (Strauch, Radtke, & Lupou, 2010). However, the anchoring of media-related competencies in these standards is rather marginal (see chapter 2).

This poses a problem because standards for media-related competencies are of great importance for quality assurance since there are no formal qualification standards in the heterogeneous field of adult education. Competence profiles for adult educators can provide an important orientation both for the recruitment of staff and for the design of initial and continuing training for adult educators.

Accordingly, it can be assumed that the teachers will acquire media-related competencies essentially in a self-directed and informal manner (Strauch, et al., 2010). Therefore, it is hardly possible to make statements about media pedagogical competencies of adult educators on the basis of qualification standards or study courses. In addition, surveys or assessments to evaluate media pedagogical competence of adult educators are lacking.

Instruments for the assessment of adult educators' competence

There are different examples of tools for measuring adult educator competencies. For example, in the USA the framework of PRO-NET 2000 was developed to record competencies for teachers and managers in adult education (Sherman, Dobbins, Crocker,

& Tibbetts, 2002). Furthermore, the project VINEPAC, which developed and tested a “Validpack” for self-evaluation and external evaluation to accredit prior experiential learning (APEL) in the field of adult education (Sava & Lupou, 2009) and the Flexi-path project, which developed a toolkit for recording the competences of adult educators on the basis of a competence profile (Strauch et al., 2010). Moreover, in Austria the Austrian Academy for Continuing Education (WBA) introduced a procedure to support the professionalization of the adult education sector (Prokopp & Luomi-Messerer, 2010) and in Switzerland an official certificate and official confirmation that trainers in adult education are able to prepare, conduct and evaluate courses is in use (Kraus, Schmid, Thyroff, 2015). Recently, the development of a process for validating competences of adult educators is being driven forward in Germany (Lencer & Strauch, 2016).

As a rule, these procedures are also open in order to record media pedagogical competencies. The extent to which media-related competencies are recorded depends on the extent to which they are contributed by the participants themselves or requested by the instruments. Marx, Goeze, and Schrader (2014) explain,

However, with the rating scales asking teachers and or their peers or supervisors to estimate and mutually validate the degree of knowledge and competence of a teacher, these capabilities are more ascribed than tested by concrete demands. Thus, an objective, reliable, valid and empirically evident test is not available yet that can assess adult teachers' knowledge and competence in term of individual diagnostic in reaction to challenging (knowledge) tasks that can be failed (as in reality) (Marx, Goeze & Schrader, 2014, p. 172).

Starting points for the development of tests for adult educator skills can be found in the area of teacher training in schools; where there is a deeper and broader debate on knowledge and competence tests, especially in the USA, but also in Europe. But, instruments vary widely, thus comparison between study findings is compromised. Importantly, differential literacies are measured by these instruments, such as computer literacy, digital literacy, media literacy, IT, or ICT literacy, computer competence, digital competence, media competence, and/or IT or ICT competence (c.f. Ferrari, 2012). Moreover, different constructs (competence, knowledge, attitudes) are measured and different methods are used (Taddeo, Cigognini, Parigi, & Blamire, 2016).

In the context of the present study we use the term media competence. In contrast to knowledge, the concept of competence also includes a practical application of what has been learned. Rychen and Salganik (2003) define competence ‘as the ability to successfully meet complex demands on a particular context through the mobilization of psychosocial prerequisites (including both cognitive and noncognitive aspects).’ (p. 43). Media pedagogical competence is understood here as the willingness and ability to use digital media responsibly in teaching and learning contexts.

In the following chapter we will examine which models for describing media pedagogical competence already exist and whether they comprehensively describe the requirements for the use of digital media by adult educators.

A competence model of media pedagogical competence of adult educators

Competence Models in Adult Education

Policy makers (in particular the European Union) and different research institutions worldwide have endeavoured to foster professionalization in adult education by developing competence frameworks for adult educators. Some quite well-known models with an impact on professionalization in the field can be analysed for the way they address

media competence and media pedagogical competence of adult educators as a relevant part of professional skills in this field.

For instance, in the US, the Maryland Department of Labour Licensing and Regulation (2015), together with a group of practitioners, developed standards for trainers in the field of adult education. One of the six general standards applied in the model directly points to the implementation of media in adult education programs and therefore documents seven key competences for adult educators:

Understanding of technology concepts and effectively utilizing a variety of technologies;

- Exploring, evaluating and using technology resources;
- Using technology to communicate information;
- Applying knowledge of legal, social, ethical, and safety issues related to technology;
- Integrating technology into instruction;
- Applying knowledge of the use of assistive technology; and,
- Participating in activities and using resources to support ongoing professional growth.

All skills mentioned here are described more in depth with different sub-skills. Using technology and digital media are understood as an independent and important part of an adult educator's professional competence.

Moreover, a European team of researchers, headed by Researcher voor Beleid, developed a model of key competences for adult learning professionals based on the analysis of job advertisements, train-the-trainer programs, and research literature that addresses the skills of adult educators (Buiskool, Broek, van Lakerveld, Zarifis, & Osborne, 2010). In this study, media-related skills are addressed – among others – within the general competences:

Competence in making use of different learning methods, styles and techniques including new media and being aware of new possibilities and e-skills and assessing them critically: being able to deploy different learning methods, styles and techniques in working with adults. (Buiskool, et al., 2010, p. 50).

Knowledge about learning technologies, the ability to apply these technologies and being open to develop one's own media use further are seen here as central components of the competence area. Furthermore, the authors formulated special competences to design digital learning environments and to support learners and trainers in using these environments under the title "ICT-facilitator". In general, it can be stated that digital media and in particular designing learning environments are highly relevant within this set of competences.

Furthermore, the European Union promoted the development of a media pedagogical competence model for teachers (Redecker, 2017) – the DigiCompEdu framework – that was developed on the basis of discussions and consultations between experts and practitioners, as well as literary research and analysis of existing instruments. The competence model aims to address teachers in all educational sectors and is therefore not specialised in the field of adult education.

The model consists of 22 facets of media pedagogical competences within six areas: professional engagement, digital resources, assessment, teaching and learning, empowering learners and facilitating learners' digital competence-

Based on this, six competence levels are formulated (A1 Newcomer; A2 Explorer; B1 Integrator; B2 Expert; C1 Leader; C2 Pioneer). The descriptions of which may-serve as a basis for reflection in regards to teachers' digital competencies.

In sum, these exemplary competence concepts refer to (digital) media as a relevant tool for adult educators and claim for skills to apply these tools for designing learning environments and enriching teaching practice. At the same time, they focus only on the role of digital media in the process of knowledge dissemination mostly without taking into account the possibilities to facilitate the preparation or evaluation of learning arrangements or the communication and counselling of adult learners. Nevertheless, they provide an important resource for the description of media pedagogical requirements for adult educators.

Models of media competence and media pedagogical competence

There are different models and conceptualizations of media competence (cf. Ramirez-Garcia & González-Fernández, 2016) or media literacy (c-f. Nagle, 2018; Wade et al., 2017). While literacy concepts traditionally focus on the ability to make use of (digital) media, media competence includes also a critical reflexive component and a broader knowledge about media and technology (c-f. Schmidt-Hertha & Rott, 2014). One of the oldest and most prominent concepts was developed by Dieter Baacke in Germany in the early 1970s based on the linguistic theory of Noam Chomsky and the communication theory of Jürgen Habermas. When developing his idea of media competence further, Baacke (1996) differentiates four dimensions, media critique, media science, media use, and media design. This model was used by other researchers (e.g., Treumann, Baacke, Haacke, Hugger, & Vollbrecht, 2002) to develop empirical tests to examine media competence of different target groups.

Furthermore, Blömeke (2000) developed a model for media pedagogical competence for trainee teachers. She distinguished four components which have been developed further by different researchers (c-f. Tulodziecki & Grafe, 2012; Tiede, Grafe, & Hobbs, 2015): (1) To be able to apply media for teaching and learning (media didactic competence); (2) developing the media competence of pupils is another task that teachers should be prepared for. Therefore, it is necessary to know facets of media competence and how to promote them; (3) teachers should be able to make use of digital media to apply innovations on the level of organizational development in their schools; and, (4) a central prerequisite for these competence facets is the general media competence of teachers. Furthermore, Tulodziecki (2010) identified that the ability of teachers to evaluate the meaning of media in the life of their students may also be an important dimension to consider.

While these ideas of media pedagogical competence have also been tested in empirical research, they can inspire similar constructs for the field of adult education. However, adult learners may be much more diverse, more experienced and have their own ideas about how to apply media in learning environments. In addition, adult education concerns a diversity of fields, with a much wider range of content. Thus, adult learners potentially have a large heterogeneity in terms of motivation and competence.

Media pedagogical competence model

Particularly for adult education, prior to the model introduced by Schmidt-Hertha, Rohs, Rott and Bolten (2017; Figure 1), there were no models for media pedagogical competence of teachers. The above-mentioned models, which take up media-related

competence facets, are perhaps unsuitable for a detailed description, since they tend to take up and describe media-related competences only in passing, or refer very strongly to an application at the didactic level.

The model from Schmidt-Hertha et al. (2017) also describes media-related facets with a broader pedagogical focus, derived from previous models of adult education (e.g. Bernhardsson & Lattke, 2011; Buiskool et al., 2010; Maryland Department of Labor Licensing and Regulation, 2015), which were examined for media-related facets. In addition, the authors undertook semi-structured interviews with four experts in the field of adult and further education and two guided group discussions with adult educators (first group with six adult educators, second with seventeen adult educators and other stakeholders who were considered experts in the field of adult education), which were analyzed with content analysis conducted (c-f. Mayring, 2000) using MAXQDA software for a computer-assisted qualitative data analysis (Woolf & Silver, 2017). From these theoretical and empirical foundations, media pedagogical requirement descriptions for adult educators were generated and sorted by content. An important part of the model is that it addresses the need to consider that media pedagogical competence cannot stand alone, but is based on more generic pedagogical and media-related competences – as described in the TPACK model (Mishra & Koehler, 2006).

The TPACK model (Mishra & Koehler, 2006) differentiates three core areas of teachers' knowledge: (1) content knowledge as indispensable as teachers should be experts in the field they teach; (2) pedagogical knowledge, regarding how to facilitate learning; and (3) technological knowledge, which focuses on the skills to use media in a very general manner.

In the *model of media pedagogical competence for adult educators* (Figure 1.) these dimensions are referred to as generic competence, subject-related competence, educational and didactic competence, and general media competence. Field competence was added, because it seems to be highly relevant for the adult educator to know as much as possible about the lifeworld and workplace of their participants (c-f. Schmidt-Hertha et al., 2017). The term competence here was used to underline that it is not only about the knowledge of adult educators, but also about their skills, attitudes and motivation to make use of media in their professional activities (c-f. Klieme, Hartig, & Rauch, 2008). Schmidt-Hertha et al. (2017) pick up the idea of content knowledge and call this subject didactic competence, which does – like the other competences mentioned so far – not belong to the core facets of media pedagogical competence but has to be seen as a necessary base for it. Moreover, in the heart of their model (c-f. Figure 1), there are four facets of media pedagogical competence, two of them have been added with respect to the particular conditions in the field of adult education: (1) Media didactic competence is similar to technological pedagogical knowledge in TPACK. (2) Subject-specific media-related competence can be seen as a counterpart to technological content knowledge in TPACK. (3) Media related field competence refers to the knowledge of adult educators about the media usage habits of their participants and knowledge about what applications they are used to, and which one is new to them. (4) Media-related attitudes and values seem to be important when it comes to the question if adult educators are motivated to apply digital media in their courses and if they feel comfortable in doing so. Overall, the model has some similarities with the TPACK model of Mishra and Koehler (2006), but also some additional facets which seem to be of particular relevance in the field of adult education.

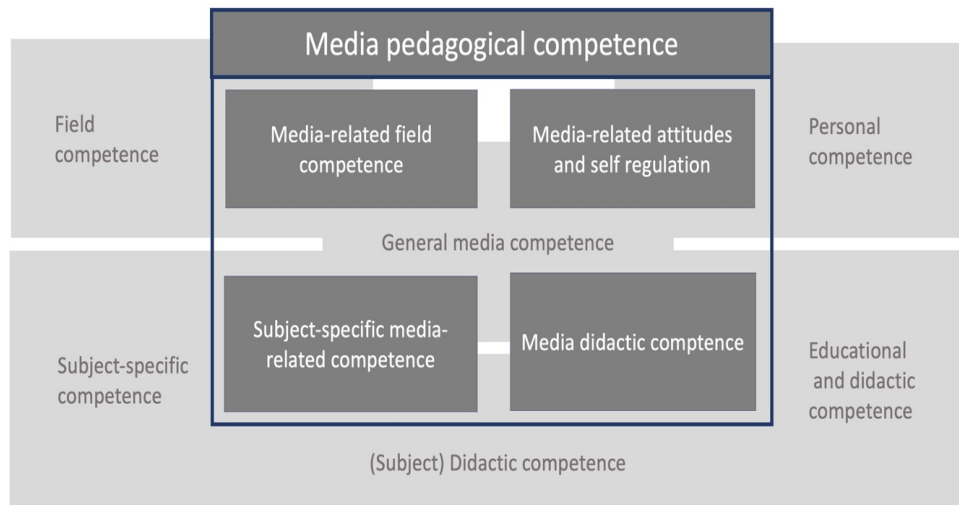


Figure 1: Model of media pedagogical competence for adult educators (Schmidt-Hertha et al., 2017)

Method

Methodological Design

Based on the previously described model of media pedagogical competence of adult educators (Schmidt-Hertha et al., 2017; Figure 1.) and its theoretical and empirical foundations, a test instrument was developed and tested in order to gather data on the current level of media competence of adult educators. The therefore identified competence requirements were converted into specific requirement descriptions. With these, it was possible to describe the competencies of each facet of the model. Following, media didactic competence was transferred into a performance test, the media-related field competence and the media-related attitudes into self-assessment scales. Media-related expertise has emerged as extremely subject-specific in this approach, which is why this facet was non-generalizable in a test.

	Media-didactic competence	Media-related field competence	Media-related attitudes and self-regulation
Number of items	26 items	22 items	31 items
Method of survey	performance test	6-point-self-assessment-scales	6-point-self-assessment-scales

Table 1: content blocks of the test instrument

In the first part of the survey, participants were asked about their demographics and their employment in adult education. In detail, they were asked about their working conditions and their courses, based on a classification used by Martin et al. (2017), as well as about educators' media usage and their own participation in courses about media pedagogical topics.

The second part was the performance test of their media didactical knowledge. In this section, 26 questions were included. The content of these questions was generated out of a systematization among fields of practice (consultation, teaching, and design of learning environments) and an educational chain of action (preparation, diagnosis, implementation and evaluation) resulting from the previously found requirement descriptions. In any combination of these areas of practice and areas of actions, we included at least two items in the performance test. In the combination of implementation with teaching and design of learning environments, we developed 3 items. This ensured that the widest possible range of content was covered by the performance test instrument (The test instrument exists so far only in German). In the following you will find a translated item:

What do you have to expect from an online feedback compared to a feedback round in a classroom event? *Please select one or more options from the list.*

- a) That the feedback is harder and more directly articulated than in a classroom setting.
- b) That the participants are generally more satisfied.
- c) That fewer participants participate in feedback.
- d) That participants do not respond to further questions.
- e) That in the case of written communication, feedback is much shorter than verbal feedback.
- f) That in the case of written communication the feedback is less authentic.

The test items were discussed and adjusted within the project team and in a workshop with a group of scientific experts to confirm content validity.

In the third part of the survey, participants deal with media-related field competence. This facet was divided with 22 items into different 6-point-self-assessment-scales about knowledge and about the meaning of media for their target groups (including usage habits of their target group, media as learning opportunities or obstacles and media in the professional and private life of the participants of their courses, e.g. *What significance does the media-related knowledge of your participants have for your teaching activities?*¹) about using their knowledge about target groups for preparing courses (e.g. *To what extent did you deal with the media-related knowledge of your participants during the preparation of an event?*), about media-related cultures in companies (e.g. *How important is it for you to deal with the media-related culture in a company where you teach?*) and about occupational changes through digitalization (e.g. *How well do you know about the changes in the working environment of your target group as a result of digitisation?*). The content selection of this facet was also based on the previously found requirement descriptions.

The fourth and last section of the survey consisted of 31 items concerning media-related attitudes and self-regulation specifically examining: Content communication

channels with participants of the adult educators beside the courses; attitudes about digitisation (e.g. *Digital forms of communication with my participants are too impersonal for me.*); willingness to use digital media for teaching (e.g. *I use the Internet to search for materials for my teaching.*); attitudes towards the usage of digital media for teaching and preparing courses (e.g. *When I use digital content for my teaching, I check the sources and content.*); willingness to reflect the usage of digital media in teaching (e.g. *I reflect on the effect of the use of media in my courses.*); and, attitudes towards changes in the professional fields through digital media (e.g. *Digitisation increases the danger for me of becoming unemployed.*). In this section, we also asked the adult educators to undertake a self-evaluation about their media pedagogical competence. The self-evaluation consisted of 6-point-scales, with items adapted from established questionnaires (Treumann et al., 2002; Treumann et al., 2007).

Recruitment and Sample

The questionnaire data were collected via an online survey, distributed in collaboration with various adult and further education associations in Germany. In addition, we were able to use incentives to motivate adult educators to take part in this long and detailed survey. On average, the participants needed 53 minutes to complete this questionnaire. 1.524 began to process the questionnaire, of which, 622 completed the whole survey. The data has been adjusted for dropouts and cases with conflicting information, which was applied to the following analyses without weighting.

Participating adult educators all work in the German adult education sector. Like in many other countries, there is no obligatory training for adult educators in Germany and their educational and vocational background is rather diverse. The majority of adult educators in Germany are working in another business in their first job and less than 30% are full-time adult educators, and even more than half of those are freelancers (Martin et al., 2017, p. 70-74). However, in our sample this was slightly different, as 43.1% worked full-time in adult education. Some two thirds of German adult educators have a university degree (Martin et al., 2017, p. 110), in our sample the share was a little higher (74.6%). The adult educators who completed the questionnaire were on average 52 years of age, one year older than in a representative survey of adult education staff from 2014 (p. 63). Among respondents, 36% were male and 64% female. In comparison to the population of adult educators in Germany, women overrepresented in our sample. Looking at the institutions in which these adult educators taught predominantly, teachers in adult education centres (germ. “Volkshochschule”) were overrepresented in the sample (see. Table 2). This may explain the gender ratio to some extent because in adult education centres there are significantly more women teaching than men (ibid.).

Private, commercial institutions	7.1 %
Private, non-profit institutions	3.9 %
In-company Training	2.6 %
Vocational school or college	7.4 %
Adult education centre	71.4 %
Institution of a church, party, union, foundation or association	7.6 %

Table 2: Institutions in which adult educators taught predominantly in the present sample (n = 622)

Within the sample, there were adult educators who taught predominantly in every kind of institution. When considering the topics in which the participating adult educators taught, it can be seen that one in three of them taught in at least two subject areas. Overall, 55 % of them gave courses in the subject area languages, culture and politics, 24% in nature, computers and technology, 23% in pedagogy and social skills, 22% in health and physical education and 14% in economy, labour and law. Looking at the teaching experience, the sample shows a noticeable distribution: while 27% of them had a maximum of 5 years teaching experience, as many had 20 years or more of teaching experience. Each 15% of the participants had five to nine years, 10 to 14 years and 15 to 19 years of teaching experience.

Because an online survey was utilized, it can be assumed that only adult educators who already use digital media participated in our survey (On average, over 90% of the adult population in Germany were online in 2018; Freese & Koch, 2018). Since the questionnaire was very long and the participation voluntary, it can also be assumed that the participating adult educators were interested in our research topic. Nevertheless, almost half of the participants (45%) had never or at least not during the last five years attended a digital media training on their own. After all, a third of the respondents took part in one to two training courses on digital media, 20% had even attended such courses three or more times during the last five years. Although it could be assumed in principle that teachers in adult education have an interest in continuing education, precarious employment relationships are a frequent reason not to participate in continuing education. Non-participation is perhaps therefore not synonymous with little interest. At the same time, informal learning can also be ascribed great importance, so that it is not possible to deduce competences from participation in further education.

Results

Quality of the questionnaire for the assessment of media pedagogical competence of adult educators

In order to confirm objectivity, reliability, and validity of the instrument, detailed considerations were given toward these aspects.

Objectivity

In order to achieve high evaluation objectivity, the test result should not depend on the evaluating person, but rather on objective measurement criteria (Babbie, 2012, p. 147) which is also related to the question formats used in the performance test. The used performance test for media didactics included 25 single- and multiple-choice questions which evaluation criteria are contently defined and can therefore be objectively evaluated using mathematical schemes. In addition, the part of the performance test also includes one open question. For this purpose, detailed coding rules were established. Two researchers independently coded the answers to this open question (Krippendorff's, 2014 $\alpha = .71$). So it can be assumed that the evaluation of the test instrument took place objectively. The other parts of the questionnaire were not constructed as performance tests, so there are neither right nor wrong answers to identify.

The test was not designed for individual diagnosis, but only for looking at the distribution of media pedagogical competence of adult educators. The results of this survey serve exclusively to describe the current condition in the selected group. No individual diagnostic evaluations or minimum standards were defined for the

performance test, which must be fulfilled in order to demonstrate competence in media pedagogy. In addition, the test was used for the first time in a slightly larger sample in this survey; so, no reference values are available for a comparison to date.

Reliability

In the context of this survey reliability is represented by the internal consistency. In the performance test on media didactic competence of adult educators the Cronbach's α was .69. Although the reliability cannot be regarded as very good, it is still close to the reliability values of popular personality tests (Körner, Geyer, & Brähler, 2002). This part of the questionnaire also consists of heterogeneous test items that capture the heterogeneous construct of media didactics in particular and media pedagogic competence in general. If a performance test contains items that are rather heterogeneous for content reasons, the actual reliability with consistency analyses is usually underestimated (Schermelleh-Engel, 2012, p. 137). In addition, media didactic competence is only one part of media pedagogical competence. In-examining all items belonging to media pedagogical competence, these items had a Cronbach's α of .86. For these reasons, the reliability of the used operationalization was interpreted as sufficiently good.

Validity

The contents of the construct media pedagogic competence for adult educators were theoretically well-founded. In addition, the contents of the test instrument were discussed in various groups of adult educators and with experts in this field. This ensured that the contents were discursively hedged, which is why the content of the test instrument can be considered as valid. The ecological validity states that it should be aimed at making the examination conditions as similar as possible to everyday situations in order to be able to conclude from the test results on situations outside the test situation (Messick, 1987). In order to fulfil this criterion, the test instrument was designed in a way that the questions and tasks are similar to the preparing, teaching and evaluating courses as an adult educator. Construct validity includes empirical evidence and arguments used to support the reliability of interpretation of test results in the sense of explanatory concepts that explain both the test results themselves and the relationships between the test values and other variables. The difficulty of the items in the performance test of media didactic competence varied between $32 \leq P \leq 83$ and spreaded widely in this spectrum. This points out a good construct validity.

Media pedagogical competence

In order to take a closer look at the media pedagogical competence within the sample, an exploratory factor analysis was carried out with all items of the three collected facets to check whether the contents of the model can be reproduced and to reduce the number of items. All items of the three facets had a Cronbach's α of 0.86. Since the developed survey represents a test run for a shorter self-evaluation version of the questionnaire, the construct of media pedagogical competence has to be drastically reduced in content. As an extraction method, a principal component analysis was chosen to picture media pedagogical competence. Compared to others, the selected method has the advantage that normal distribution and interval scaling are not absolutely required. To achieve better

interpretability, the rotation method Varimax was additionally selected. According to the Kaiser-Meyer-Olkin-criteria, the measure of sample adequacy (MSA) is meritorious with .846 (Hair, Anderson, Tatham & Black, 1998). Out of the initial 84 items, 33 items remain in the analysis. The remaining items have a good internal consistency (Cronbach's $\alpha = .832$). To decide the number of factors to be extracted, the Kaiser-Guttman-criterion, the scree-test and the interpretability of the factors have been considered (Cramer, 2003). An item was assigned to a factor if its charge on one factor was at least .40 and at the same time having no charge over .30 on other factors, with the exception that if an item has .20 higher charge on one than another item, it also remained in the analysis (Table 2., Appendix). In addition, each factor should contain at least 3 items.

The combination of these extraction criteria suggests a six-factor solution for media pedagogical competence of adult educators with 33 items. These factors explained 55,7% of the total variance. The following factors have been extracted: factor 1 Dealing with media-related requirements of the participants (9 items, Cronbach's $\alpha = 0.903$), factor 2 media-related participant orientation (5 items, Cronbach's $\alpha = 0.81$), factor 3 Media didactic competence (8 items, Cronbach's $\alpha = 0.69$), factor 4 Knowledge about the media-related environment of the participants (4 items, Cronbach's $\alpha = 0.793$), factor 5 Rejection of digital media in teaching (4 items, Cronbach's $\alpha = 0.794$) and factor 6 Preparation with digital media (3 items, Cronbach's $\alpha = 0.84$) (3 items) (see also Table 1). When considering the content of the individual factor components, factors 1, 2 and 4 can be assigned to media-related field competence. Factors 5 and 6 include media-related settings. Factor component 3 contains - according to the name - items for media didactic competence. Even with this exploratory factor analysis, the facets of the competence model could be reconstructed.

Different types of adult educators

A hierarchical cluster analysis (Ward method with the squared Euclidean distance) was carried out to search for different patterns of adult educators of the different factor components. All of the six components of the factor analysis were included in this analysis. Based on the dendrogram, a 5-cluster solution was chosen. The adult educators of the survey can be assigned to the found clusters as follows:

Cluster 1: rejection of digital media in teaching (n = 84);

Cluster 2: little media didactic knowledge (n = 64);

Cluster 3: the average (n = 293);

Cluster 4: little knowledge of the media-related environment of the participants (n = 143); and,

Cluster 5: little media-related participant orientation (n = 38)

Cluster 1: rejection of digital media in teaching

This cluster was characterized by the fact that teachers in this group strongly rejected digital media in teaching and only used a small amount of digital media in the preparation of events. Significantly more health and sports teachers were represented in this cluster and significantly fewer teachers from the subjects nature, technology and computers were in Cluster 1 than in the comparison group. In addition, teachers in this cluster had a slightly lower education level and were more often female (both significant at 10% level).

Cluster 2: Little media didactic knowledge

On average, the educators of this cluster had little media didactic knowledge. Nevertheless, they dealt a little more with the media-related characteristics of the participants and used a little more digital media for their preparation of courses than the adult educators of cluster 1. In this cluster, there were significantly fewer full-time working adult educators than in the other clusters.

Cluster 3: the average

In the founded types of adult educators, the third cluster was the largest one which also had mean values in all factors near the average. This cluster was called "the average" and was used as a reference group for the group comparisons below. Before variance analysis were carried out, all prerequisites were checked so that the data would be suitable. Significant differences were identified with post hoc tests (Bonferroni). The adult educators in this cluster showed values close to 0 in all facets of the previous factor analysis. In the performance test of media didactical competence scored on average 17.6 out of 26 points (the whole sample scored on average 16.9 points). They usually used digital media to prepare their courses and did not reject digital media in adult educational settings. The three facets of the media-related field competence were good to satisfactory pronounced in this cluster. The other types of adult educators found are now described and compared to this average type.

Cluster 4: little knowledge of the media-related environment of their participants

The adult educators of this cluster did not deal very much with the medial characteristics of their participants and attached little importance to knowledge about the medial environment of the participants. There were significantly more teachers of health and sports in this cluster and far fewer teachers of business, labour.

Cluster 5: little media-related participant orientation

The educators of this cluster were less concerned with the media-related characteristics of the participants and had a very low media-related participant orientation. However, these teachers were more likely than average to use digital media for preparation. In this cluster, there were no adult educator teaching in the subjects of nature, technology, computers. In addition, members of this cluster had significantly shorter work experience.

Discussion

To the knowledge of the authors, this is the first study to provide objective data on the media pedagogical competence of adult educators. Due to the high level of participation in the study, the results are highly informative and provide some insights into the skills and attitudes of adult educators related to the use of digital media in their teaching.

The results showed that the adult educators surveyed had neither special media pedagogical skills nor were they particularly skeptical about digital media. There were also no dichotomous groups. On the contrary, an entire range of competences and attitudes was evident, without pronounced extremes. Although it is not possible to say whether the competences of the interviewees was sufficient for their teaching activities or whether the competence level was too low, the data however suggest that experience and knowledge in adult education and digital-media leads to a much more open and critical use of digital media. From this potentially the demand could be derived to integrate media pedagogical contents more strongly into the education and further training of adult educators.

When interpreting the findings of the present study, it should be considered that there is little focus internationally on the field of adult education in Bachelor programmes in educational science (Lattke, 2007). Specialisation generally only takes place in Master programmes, which are generally offered as consecutive courses of study; thematic focuses include e-learning, teaching, management and leadership tasks and vocational training (ibid., p. 3). The contents of the courses of study are hardly comparable. Likewise, the proportions and emphases of media pedagogic are - on a first glance - very different. Nonetheless, it must be considered that many teachers in adult education (e.g. in Germany one-third) do not have any educational degree from university (Koschek, 2018).

At the beginning of this report it was identified that there is no basis for statements on media pedagogical competence of adult educators. One potential reason for this is that little importance has been previously attached to the media pedagogical competence of adult educators. On the other hand, there were previously hardly any tests to evaluate the media pedagogical competencies of trainers. In the field of adult education, only a series of procedures for self- and peer-assessment based on interviews, observations, reports and document analyses of educators could be found. These approaches were partly linked to the low level of formal pedagogical qualifications in adult education and have the aim of formally recognising informally acquired competences or promoting the quality of adult education.

The research results presented in this article however provide the basis for a comprehensive description and assessment of media pedagogical competences of adult educators. In addition, they allow a detailed analysis and assessment of the extent to which requirements for the professionalization of adult educators are anchored.

Nonetheless, there were also some limitations in the interpretation of the data. First, there were no concrete requirement descriptions with which the results could be compared. These would have to be defined for the sub-areas of adult education. The competence model presented here could provide an important basis for this. A further limitation resulted from the fact that the heterogeneity of adult education was only partially represented. In this sense, the results did not permit an evaluation across the entire spectrum of adult education.

From a more practice-oriented perspective, the test could perhaps be helpful as an instrument for adult educators to check their own competencies related to the use of digital media and to use this information for further professional development. Therefore the test has been published online as a self-test and some adult education associations are already developing train-the-trainer programs related to the facets of media pedagogical competence named in our model. Knowing in which areas of media pedagogical competence they have development potential, adult educators can choose specific train-the-trainer programs that fit for their profile.

Conclusion

The media pedagogical competence model and the test based on it represent a first attempt to describe and objectively measure media-related competences of adult educators. The results—provide initial insights of media pedagogical skills and attitudes of adult educators. Five different types of adult educators were identified: Adult educators with a negative attitude towards digital media, such with little media didactic knowledge, little knowledge of the media-related environment of the participants, little media-related participant orientation, and teachers with a negative attitude towards digital media.

In order to assess these results, it is only possible to do so against the background of real competence requirements or normative ideas about necessary deemed competences. In the heterogeneous field of adult education, this assessment may certainly lead to very different results and disparate consequences. Therefore, a more detailed consideration of the media pedagogical requirements in the different sub-areas of adult education is necessary in future empirical studies.

Notes

¹ All examples mentioned here are free translations and were used in the test in German.

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Appendix

Table 2: Rotated component matrix

Name of factor	Variables	1	2	3	4	5	6
1 Dealing with media-related requirements of the participants	Preparation in consideration of the media-related competences of the participants	,795					
	Knowledge about the media-related knowledge of participants	,740					
	Knowledge about the learning opportunities of digital media for participants	,734					
	Knowledge about the learning obstacles of digital media for the participants	,733					
	Knowledge of the media-related culture of the organization	,725					
	Knowledge about the media usage habits of the participants	,711					
	Knowledge about the organizational culture in relation to the media-related design	,698					
	Knowledge about the media-related competence of the participants.	,629	,304				
	Knowledge of the participants' professional use of the media	,613					
2 Media-related participant orientation	Relevance of knowledge about learning obstacles for teaching		,746				
	Relevance of the media usage habits of the participants		,714				
	Relevance of the media-related knowledge of participants		,694				
	Relevance of the learning opportunities of digital media for participants		,690				
	Relevance of the media for professional use		,656				
3 Media didactic competence	Aspects for motivated studying during e-learning units			,708			
	Selection of topics for implementation in digital settings			,603			
	What to pay special attention to as an e-moderator			,599			
	Aspects of the design of digital learning environments			,594			
	Advantages of digital learning diaries			,575			
	Comparison of feedback in face-to-face events with digital settings			,574			
	The use of images, videos and texts from the Internet in teaching courses			,462			
	Didactic use of the smartphone in courses			,435			
4 Knowledge about media-related environment of participants	Knowledge about changes in the living environment through digitalization (I)				,768		
	Knowledge about the working environment of the participants (I)				,757		
	Knowledge about changes in the living environment through digitalization (II)				,742		
	Knowledge about the working environment of the participants (II)				,712		
5 Rejection of digital media in teaching	Digital media are superfluous for my teaching					,784	
	No need to deal with digital media.					,743	
	No added value of digital media for teaching.					,731	
	No interest in using digital media in teaching.				,687		-,318
6 Preparation with digital media	Use the Internet to search for materials for teaching.					,863	
	Find something on the Internet that can be used for teaching					,850	
	Information on the Internet about the subject matter of teaching.					,721	
	Extraction method: Analysis of the main component.						
	Rotation method: Varimax with Kaiser normal distribution.						
	a. Rotation converged in 6 iterations.						