

Between adoption and rejection: attitudes of adult educators toward digitization in Germany

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The use of digital media in adult education is very heterogeneous. To date, there are no empirical studies that have examined the possibility that media-related differences in media usage of adult educators could be in part due to differential media pedagogical attitudes of adult educators. Moreover, there is a lack of empirical evidence to support the understanding of what factors modulate differences in media pedagogical competencies of adult educators. In order to examine different theoretical potentialities, in the present study, an online survey of adult educators (n = 626) was conducted to investigate the attitudes of adult educators in Germany toward their use of digital media. The results of the study indicate that there are influencing factors such as educational level or employment context on attitudes toward digital media.

Introduction

The digital transformation, understood as the effects of digitization on society, is characterized by great ambivalence. On the one hand, there are great hopes for innovation and an improvement in living conditions. But at the same time, it is also becoming apparent at the individual, corporate and state levels that people fear that they will no longer be able to keep pace with these developments. This is not a phenomenon that can only be observed by older people. According to a recent study of 14–24-year olds in Germany, fears of dependence on the Internet have doubled from 22 to 41 per cent and 30 per cent of respondents claim to have been affected by Internet addiction (DIVSI – Deutsches Institut für Vertrauen und Sicherheit im Internet, 2018).

The fascination of the possibilities of new technologies and the fears of the consequences often lie close together. In the same way that the pressure on individuals is growing, the number of skeptics also seems to be increasing (e.g. Lanier, 2014;

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Morozov, 2012). Also, in the field of education voices are becoming louder that call for a critical assessment of digitization (e.g. Ferreira *et al.*, 2017; Selwyn, 2015).

These ambivalences between innovation and skeptical perspectives are also evident in adult education. Even though adult education has historically a particularly close relationship to media – from the first book or reading clubs in the 18th century, to educational radio broadcasting and online distance education courses – there has always been skepticism about the supposedly high expectations and potential of digital media (e.g. Wildemeersch & Jütte, 2017). Thus, it is not surprising that the relationship between adult education and media is seen as ambivalent (Pietraß, 2015).

The practice of adult education also shows a very heterogeneous picture of the adoption of digital media, understood here as IT applications that can be used to support teaching and learning. These are not only educational media in a narrower sense, but also common communication and information media, which are also used in teaching contexts.

In a study on digitization in the field of continuing education, two thirds of training providers in Switzerland stated that digital media has revolutionized adult education. At the same time, however, in almost half of teaching digital media does not play a role (Sgier *et al.*, 2018, p. 16). Moreover, differences are also apparent in the different areas of continuing education and training. For example, a study from Germany shows that two thirds of private commercial continuing education providers attach great importance to digital media, in comparison to just one in two public providers who attach great importance to it. This difference is also evident in the use of digital media: almost 40 per cent of adult educators in private commercial institutions use digital media, whereas the figure for public providers is only 17 per cent (Schmid *et al.*, 2018).

The causes can be traced back to a lack of equipment and support on the one hand, and to a lack of media-related competence of the adult educators on the other. But this alone does not explain the low level of use of digital media. More than half of the training facilities (58 per cent) have good to very good support, and almost half (48 per cent) have good to very good technical equipment. According to statements by managers of continuing education institutions, almost every second adult educator also has good to very good media pedagogical skills (Schmid *et al.*, 2018).

Therefore, the question arises what influence attitudes have on the use of digital media in adult education. Numerous studies have shown the importance of teachers' attitudes and beliefs on the use of digital media (Christensen & Knezek, 2008). Hew and Brush (2006) identified them as one of five major obstacles to the introduction of digital media by K-12 schools. And in the so called 'Will-Skill-Tool'-Model (Knezek & Christensen, 2016) attitudes are one of three central predictors for the integration of technology in the classroom. Above all, knowledge and experience in dealing with digital media have a positive effect on media-related attitudes.

There are a number of studies on the attitudes of teachers on the use information technology in schools and universities (Njiku *et al.*, 2019). Teachers in schools and universities, however, differ both in their education and in the competency requirements. Moreover, in contrast to schools and universities, the field of adult education is not or only partially regulated by the state. In addition, there are often no formal qualification requirements for teachers of adult education. Although there are courses of study for adult education, a large proportion of adult educators have no formal pedagogical education – in Germany the rate is only 26.3 per cent (Martin *et al.*, 2016, p. 114). Therefore, the educators also have very different professional backgrounds. In addition, the field of adult education is much more heterogeneous than other fields of education in terms of objectives, contents and offers. Hence, findings from schools and universities cannot be transferred to adult education. Overall, the field of adult education research on digitization still has large gaps in research (Gegenfurtner *et al.*, this issue).

There are various ways to define attitudes (Banaji & Heiphetz, 2010). A known definition of Eagly and Chaiken (1993) described them as 'a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor' (p. 1). In the context considered here, attitudes would express themselves in a like

or dislike of the use of digital media. Attitudes are related to various other theoretical constructs, such as beliefs, conceptions or subject theories, which are sometimes used very similarly or as part of each other. Therefore, it is necessary to make the differences clear here. In contrast to attitudes, beliefs describe 'individual mental constructs, which are subjectively true for the person in question' (Skott, 2015, p. 18). In this context, beliefs 'include their educational beliefs about teaching and learning (i.e. pedagogical beliefs), and their beliefs about technology' (Hew & Brush, 2006, p. 229). According to Bodur *et al.* (2000) beliefs determine a person's attitude.

Media-related attitudes may be influenced by a 'media habitus'. This is a manifestation of the habitus, understood as a '... system of acquired dispositions functioning on the practical level as categories of perception and assessment or as classificatory principles as well as being the organizing principles of action' (Bourdieu, 1990, p. 13). The media habitus is a system of boundaries for media actions and also limits the motivation to deal with media in the teaching context (Kommer, 2013).

Attitudes toward digital media among adult educators¹

In contrast to the surveys of attitudes toward the use of technology for school teachers there are hardly any surveys focused on this topic regarding adult educators. One study published by Fernández Batanero and Torres González (2015) examined the attitudes of adult educators toward ICT in a narrower context. As part of the study, 172 adult educators from Andalusia (Spain) were interviewed online. The results showed that overall there was a very positive attitude among adult educators toward the use of ICT. Neither age nor gender had any effect on the attitude. The level of education was also irrelevant. In addition, it was found that the availability of good ICT as well as counseling on the use of ICT promoted its use in adult education.

As part of a study on digital transformation in adult education in Germany 260 adult educators were asked about their attitudes toward digital learning (Schmid *et al.*, 2018). Almost 60 per cent of respondents agreed that digital media increase the attractiveness of adult educational institutions. Slightly more than half of adult educators felt that digital media are motivating and promote access to education in rural areas. In contrast, only slightly more than a third of the respondents expected the use of digital media to improve teaching quality (37 per cent) and learning outcomes (36 per cent), especially for socially disadvantaged learners (26 per cent). Also, only about one third (31 per cent) of the adult educators expect a reduction of their workload, whereas one quarter of the respondents do not expect this. The latter statement is of particular importance, as the majority of adult educators in Germany work under precarious conditions and with a constant lack of time (Martin *et al.*, 2016, p. 98). It is therefore not surprising that almost half of those surveyed (44 per cent) regarded the lack of payment for the increased effort for using digital media as a major obstacle for technology integration. In summary, it can be said that adult educators see the benefit of digital media especially in terms of the marketing of the educational institution and enabling access for learners. In addition, from the point of view of adult educators it can be seen that the increased effort in using digital media is not worthwhile.

The already mentioned study from Switzerland (Sgier *et al.*, 2018) came to similar conclusions: An online survey of 338 continuing education institutions has shown that a large proportion of digital teaching applications have little didactical benefit. A high to very high benefit is seen above all in learning management systems (54 per cent) and web-based training (51 per cent). Sixty per cent of the respondents stated that the use of digital media improves the individual support of learners, but only 39 per cent expect an improvement of learning outcomes. In accordance with the study from Germany, it also shows that the use of digital media is regarded as difficult for people who have not pursued a process of learning using media for a long-time. It can also

¹ There is no clear description for people who are teaching adults. In contrast to the term 'trainer', often used in vocational education, and 'teacher', used in the school context, we use the term adult educators as a broader term in continuing education.

be seen that the skill demands on adult educators using digital media are estimated to be high (71 per cent) and that only a few respondents see the use of digital media as a relief (27 per cent).

It is important to note that the transferability of the findings of both of the above studies is limited due to the country-specific situation of the financing of adult education, the professionalization of adult educators and the quality assurance systems et cetera. Furthermore, no statements can be made whether the interviewees had sufficient media pedagogical competence to answer the questions in a well-founded manner or not. Neither of the two studies indicates to what extent they are representative in terms of the distribution of providers across different sectors of continuing education or the adult educators surveyed.

Even if it must be mentioned restrictively that these findings are not based on any measurement and that the competences may not be so pronounced that a valid assessment can be assumed, the picture is nevertheless very uniform. Although greater differences must be assumed between the areas of adult education, the use of digital media is restrained. Inadequate competences of adult educators, a lack of equipment and a low demand for media-supported further training courses can be assumed as possible causes. However, there is also a widespread skepticism about the didactic benefits of digital media, especially for people with learning difficulties. In addition, the use of digital media is also seen to increase the burden on adult educators themselves, which may contribute to a rejective attitude toward the use of digital media in courses.

Research question and assumptions

As shown above, a very heterogeneous picture emerges in the area of media-related circumstances in adult education. However, previous studies have not looked closely at what attitudes can be found behind the attribution of added value to digital media for a didactic setting. The present study is intended to close this gap and tests the influence of socio-demographics, the adult educators' employment context and media-related further training courses on attitudes toward digital media.

As mentioned above, the media habitus can be seen as a determining factor for media-related attitudes. This sociological concept examines, among other things, the influence of socialization factors on different lifestyles, tastes and attitudes. Bourdieu (1984) pointed out that socioeconomic status has a formative influence on all spheres of life and perceptions of habitus owners. Building on these studies, the question arises whether there are socioeconomic factors influencing the media-related attitudes and values of adult educators or not.

Based on these assumptions, there was a presumption that adult educator socioeconomic status has an influence on media-related attitudes as well. For example, it can be assumed that a higher level of educational attainment is a more conducive factor for a critical examination of the media or that higher age has a negative influence on a positive attitude toward the media (Schmid *et al.*, 2018). This can be attributed to a different media habitus of people who didn't grow up in a digitized social and working environment. The attitudes and values toward digital media are shaped by other (more or less digitized) worlds depending on the time of growing up. As a result, digital media has entered one's life at different times and under different conditions. Depending on the preconceived attitudes and experiences in the process of digitization, the entry of digital media into one's own working and living environment is then perceived and interpreted differently.

Furthermore, the employment context and the participation in media-related pedagogical training should be of influence on the attitudes toward the use of digital media in adult education. On the basis of the described results from the two German language surveys on media use in adult education, it can be assumed that adult educators working in public training providers use less media than the private providers (Schmid *et al.*, 2018; Sgier *et al.*, 2018). It can therefore be suspected that this result will also be reflected in adult education centers (volkshochschulen), as these are also part of public continuing education. If, as presumed, the use of media is related to attitudes, it

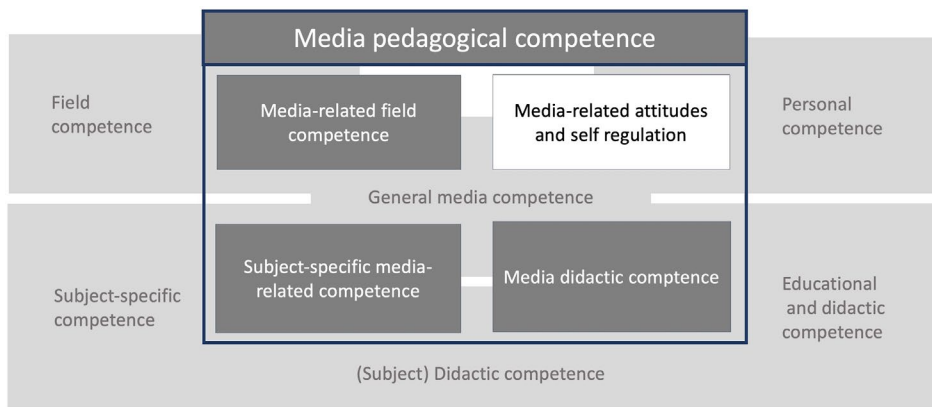


Figure 1: Media pedagogical competence requirements for adult educators. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/jt.12170)]

can be supposed that trainers in Adult Education Centers tend to have more rejecting attitudes toward digital media compared to commercial providers. Employed trainers and trainers who participated in media-related pedagogical training should show more positive attitudes toward digital media.

Methodology

Media-related attitudes can be seen as part of the media pedagogical competence of adult educators (Figure 1). In our understanding, attitudes are an essential element of competences (cf. Eraut, 1994). The basis for the study presented here is a media pedagogical competency model, based on a literature review of media pedagogical competence models in the field of adult education as well as qualitative research in the form of interviews and expert focus groups. The model consists of four competence facets, based on general pedagogical and media competence (for further information about the test instrument see Rohs *et al.*, 2019):

1. *Media-related field competence* encompasses all areas that adult educators know and can use in their field of activity. This includes, e.g. knowledge about the media culture of the organization or company in which they work and teach, but also media-related knowledge about their learners, such as their media competence or their living and working environment.
2. *Subject-specific media-related competence* includes all competences that can differentiate very differently depending on the subject matter. Depending on the teaching content, different technological knowledge is required, e.g. on the hardware side or also programs that are used.
3. *Media-didactic competence* is classically equated with media pedagogical competence in the teaching context. Media didactics describes the competent application in the teaching/learning context, which offers added value for the learners. On the one hand, this can be in the immediate teaching situation, but on the other hand it also includes the areas of preparation and follow-up of the teaching.
4. *Media-related attitudes and self-regulation* describe, as mentioned above, basic positive or negative orientations for the use of (digital) media in teaching. Self-regulation in this context is related to the ability to reflect on one's own emotions and actions in relation to the use of (digital) media. For example, the respondents were asked about their attitudes about digitization (*Digital forms of communication with my participants are too impersonal for me*), their willingness to reflect the usage of digital media in teaching (*I reflect on the effect of the use of media in my courses*) or their attitudes toward changes in the professional fields through digital media (*I am afraid that digital developments will make my role as a teacher superfluous*) The

answers to these questions form the basis of the results presented here (for all item wordings see Table A1 in Appendix).

In line with other definitions, the OECD describes competences as 'the ability to meet complex demands, by drawing on and mobilising psychosocial resources (including skills and attitudes) in a particular context'. (OECD, 2005, p. 4). In this sense, attitudes are to be understood as part of competences. In the competence model used for adult educators, the areas of motivational and moral facets are included in the facet 'attitudes and self-regulation' and these are given special significance. This facet is considered separately in the present study. Based on this, Tulodziecki and Grafe (2012, p. 50) define media competence as 'the ability to critically analyze and reflect about media messages as well as to create and disseminate media messages and take action', which is a basis to develop the other areas of competence.

The self-assessment scales for media related attitudes and values were based on the interviews and expert focus groups as well as literature review divided into the five attitude tendencies. The assignment of the 23 items to the attitude indexes was based on content similarity and internal consistency regarding reliability (see Table 2). Some of the items were assigned to several attitude scales, as the attitude types partly overlap and cannot all be clearly separated from each other (see Table A1 in Appendix):

Positive and chance oriented: This attitude form comprises 11 items in the form of self-assessment scales. A positive and chance-oriented attitude describes the use of media as something that adds value to the learning process. Media are used in teaching to support learning processes and the paths to learning content have been simplified. Adult educators enjoy using media in their teaching and see the Internet as an opportunity to access learning materials. However, they are not very critical and use media when expected, but do not always reflect on their use.

Critically reflective: This attitude form comprises 6 items in the form of self-assessment scales. A critically reflected attitude based on the items is characterized by the reflected use of digital media. Sources are checked when they are used and only when they bring added value for the learner. If digital media are used, then as a diversity for the design of teaching and also to show learners new ways of learning.

Cautiously refusing: This attitude form comprises five items in the form of self-assessment scales. A cautiously refusing attitude is characterized by an avoidable rejection of digital media. Adult educators are afraid of using digital media and of digital media making their role superfluous. Digital media are regarded as superfluous for teaching and technological developments should be fought against.

Flatly refusing: This attitude form comprises five items in the form of self-assessment scales. The flatly refusing attitude shows a positive attitude toward analog, but a rejective attitude toward digital media: where analog media are viewed as trustworthy, but no necessity is seen for the use of digital media. This attitude is also characterized by the fear that digital media will make the role of the adult educator superfluous and is characterized by resistance.

Reasonably rejecting: This attitude form comprises four items in the form of self-assessment scales. The reasonably rejecting attitude is characterized by the fact that the use of digital media is rejected, but not out of fear, but because this is superfluous for the teaching of the adult educators and the wide range of learning opportunities can also be overtaxing for the learners. In addition, adult educators see digital communication channels with learners as too impersonal.

The scales are not to be understood as level scales. The aim of the scales is to trace an actual state and not to evaluate the educators. There may be good reasons why educators reject digital media in their teaching. Nevertheless, it is important in the context of modern education to deal with issues of digitization and teachers should be able to make informed decisions about when to use digital media or not. This study concentrates on the competence facet of media-related attitudes and values with the five described attitude values. This facet includes the personal attitudes adult educators have toward media and the media-related developments in society. It is a question of a pedagogical attitude toward media and whether these are ascribed to have a general

added value and opportunities or whether these are generally assessed as negative and taken from a more conservative perspective.

Data and methods

Based on the described model, an online survey of adult educators to investigate the media-related competencies of adult educators in Germany was conducted in 2017. Only adult educators who teach were part of the survey. In order to ensure this, filter questions were built into the survey to ensure allocation to teaching staff and the number of hours they teach. As part of the survey of media pedagogical competencies, the media-related attitudes of adult educators were also surveyed, as well as a wealth of personal data, including socio-demographic information, detailed information concerning employment history and information about everyday and professional use of digital media.

In total, 1524 adults filled in the questionnaire. A survey on media pedagogical competence of the order of magnitude that includes the attitudes and values of adult educators has not yet been conducted in the Germany region. As media competency was measured and these items were at the end of the survey we filtered every person that didn't answer all questions. As a consequence, our analysis includes results from 626 persons. The survey does not claim to be representative, as it is very difficult to map the population of adult educators, as many teachers are self-employed and there is no definitive data available.

As the survey was distributed across the important associations in the field of adult education in Germany and it took place online there is a bias with more women and people working at adult education centers (volkshochschulen), where a large number of the adult educators who took part in the survey are employed. The adult education centers offer both vocational and general adult education. Nevertheless, they belong rather to a humanistic tradition of adult education. The adult educators are mostly freelance and can therefore also teach at other institutions.

In addition, two educational subgroups (Hauptschule: $n = 5$; Polytechnische Schule: $n = 11$: both part of German lower secondary education) showed a very small number of cases which were then excluded from the statistical analysis. For international comparison, the remaining educational subgroups are recoded according to the International Standard Classification of Education 2011 (UNESCO Institute for Statistics, 2012). Table 1 gives an overview of all independent variables in this empirical study.

To analyse adult educators' attitudes toward digital media substantiated scales with regard to contents and internal consistency were built. The additive averaged indices

Table 1: Overview of independent variables

Variable	Description
Gender	Male = 0, female = 1
Age	–
Lower Secondary Education ¹	Dummy variable: Lower Secondary Education = 1, else = 0
Upper Secondary Education ²	Dummy variable: Upper Secondary Education 1 = 1, else = 0
Upper Secondary Education ³	Dummy variable: Upper Secondary Education 2 = 1, else = 0
Occupation	Employed in any further educational organization = 0, employed at Adult Education Centers (AEC) = 1
Type of employment	Secondary employment = 0, main activity = 1
Further training about digital media in the last 5 years	No further training about digital media = 0, at least one further training about digital media = 1

¹Equivalent German educational level: Realschule. ²Equivalent German educational level: Fachoberschule. ³Equivalent German educational level: Abitur.

internal consistency was measured with Cronbach's alpha which estimates a statistic by using the averaged intercorrelations of all items considered as well as the number of items. Normally, values of 0.7 are regarded as acceptable (Nunnally, 1978). As Cronbach's alpha is depending on the number of items included and its recommended level is regarded as dependent on the research purpose, values of 0.6 are satisfactory with a small number of items (Peterson, 1994).

Five different scales which varied from mostly positive and chance oriented to critically reflective and merely rejective beliefs were separated. Most of the scales are considered as reliable with Cronbach's alpha values of about 0.7. Only the last two scales with an alpha value of about 0.6 might be facing reliability issues. The scales range from 1 to 6 and have been inverted if necessary (for exact Item and Scale Wordings see Table A1 in the Appendix). Low values on the positive and chance oriented as well as the critically reflective scales equate to positive or reflective beliefs. Low values on the remaining scales equate to rejective beliefs. For example, if respondent 'x' has an averaged index value of '1' on all positive and chance oriented as well as all critically reflective items he or she is assumed to be highly positive and chance oriented and very critically reflective toward the use of digital media in adult education. Table 2 gives an overview of all dependent computed indices.

Table 3 shows all respective descriptive statistics. Most of the respondents are female (64 per cent) and employed at adult educational centers (69 per cent). In the sample a small amount of people were working for any other further educational organization.

Table 2: Overview of dependent variables

<i>Adult educators attitudes toward digital media</i>	
Positive and chance-oriented	Scale of 11 Items, Cronbach's $\alpha = 0.807$
Critically reflective	Scale of 6 Items, Cronbach's $\alpha = 0.770$
Cautiously refusing	Scale of 5 Items, Cronbach's $\alpha = 0.685$
Flatly refusing	Scale of 5 Items, Cronbach's $\alpha = 0.615$
Reasonably rejecting	Scale of 4 Items, Cronbach's $\alpha = 0.575$

Table 3: Descriptive Statistics

Variable	Mean	SD	Minimum	Maximum
Female	0.64	–	0	1
Age	50.35	11.805	20	82
<i>Highest Educational Qualification</i>				
Lower Secondary Education	0.0819	–	0	1
Upper Secondary Education 1	0.1237	–	0	1
Upper Secondary Education 2	0.7676	–	0	1
Employed at Adult Educational Centers (AEC)	0.69	–	0	1
Main activity	0.4309	–	0	1
Further training about digital media	0.5450	–	0	1
<i>Adult educators attitudes toward digital media</i>				
Positive and chance-oriented	2.1901	0.71271	1	6
Critically reflective	2.1273	0.86828	1	6
Cautiously refusing	4.9717	0.88325	1	6
Flatly refusing	4.9556	0.83016	1	6
Reasonably rejecting	4.2697	0.92867	1	6

MEKWEP-Survey 2017, $N = 626$.

Thirty-seven adult educators (5.9 per cent) were employed in the private commercial sector, 22 (3.5 per cent) in the private non-profit sector, 15 (2.4 per cent) were working for operational institutions, 42 (6.7 per cent) were working for a vocational school and 36 (5.8 per cent) for a church, party or union institution. Also, 76 per cent of the respondents had the highest educational qualification. The average value for people on the positive and chance-oriented and critically reflective scale was about 2.1, whereas the equivalent value of the negative dimensional scales was about 4.2 and higher.

The research question and assumptions were tested by performing mean comparison t-tests and multivariate regression analysis. To address differences between various subgroups (e.g. between the youngest and oldest adult educators), mean comparison tests were performed. T-tests confirmed whether the homoscedasticity of both variables was satisfied or not. Multivariate regression analysis was used to test the effect size of each independent variable and to check for confounding variables to see if the estimated correlations were stable under inclusion of other variables. To examine whether the estimated models were unbiased the normal distribution was also reviewed or not. Additionally, the model was checked against the 'BLUE' assumptions proposed by Urban and Mayerl (2016). Limitations of the statistical analysis due to the cross-sectional data are discussed below.

Results

The results of the mean comparison tests in Table 4 confirm part of our assumptions. The negative dimensional scales show significant mean differences only for the main activity and skill enhancement variables. In regards to demographic influences, younger people were significantly more critically reflective than the older cohort ($p < 0.005$). Additionally, educators with higher educational attainment were significantly more positive and chance oriented, as well as critically reflective toward digital media (cf. Table 4). But, there were no significant mean differences for sex.

Employment context also significantly influenced educators' attitudes toward digital media. People who weren't working at an Adult Educational Centre ($p < 0.05$) and who were working full time in adult education ($p < 0.005$) were significantly more critically reflective. Potentially, the higher educational attainment of this subgroup was decisive for these mean differences observed. At the same time, adult educators who were working full time were less flatly refusing and less reasonably rejecting of digital media in adult learning environments. A similar pattern was seen for people who were participating in media-related pedagogical training. This subgroup was more ($p < 0.005$, for all of these measures) positive and chance-oriented and critically reflective, while less cautiously, flatly refusing, and reasonably rejecting digital media.

Table 5 reports the results of the multivariate regression analysis. Every tested model fulfilled the normal distribution and BLUE assumptions² for unbiased regression models sufficiently. Accordingly, the tolerance test statistics with values about 0.80 and higher to test for multicollinearity as well as the Durbin-Watson test statistics with values about 2.00 to test for autocorrelation lied within the standard value range (Urban & Mayerl, 2016). Overall, there are similar results as for the mean comparison tests with the benefit to reveal the effect size of each coefficient and the existence of possible confounding variables. The first column of each dependent scale reports estimated regression analysis only with the socio-demographics as independent variables. The second column of each dependent scale shows the results with the remaining variables included. As the estimated coefficients do not strongly vary between the respective columns, the effect of the socio-demographics does not get affected by employment context or skill enhancement.

Contrary to the results of Table 4 where sex had no effect, women were on a 6-point attitude scale 0.156 points less critically reflective than men. The standardized effect size with $b_{\text{stand.}} = 0.088$ is very weak. Also, there are no significant age differences with $p < 0.05$. This can be attributed to the fact that in the empirical analysis earlier we

² For further information about the BLUE-assumptions see Urban and Mayerl (2016).

Table 4: Mean comparison T-tests

	Socio-demographics			Employment context			Skill enhancement
	Sex	Age	Education	Employed at AEC	Main activity	Further training about digital media	
Positive and chance-oriented	0: male (n = 222)	1: ≤30yrs. (n = 46)	1: Lower Secondary Education (n = 46)	0: Not employed at AEC (n = 187)	0: Secondary employment (n = 354)	0: No further training (n = 283)	
	1: female (n = 400)	2: 61-82 years (n = 120)	2: Upper Secondary Education (n = 459)	1: Employed at AEC (n = 435)	1: Main activity (n = 268)	1: More than one further training (n = 339)	
Critically reflective	\bar{X}_0 : 2.1282 (0.0426)	\bar{X}_1 : 1.9842 (0.1023)	\bar{X}_1 : 2.4490 (0.1313)	\bar{X}_0 : 2.1376 (0.0506)	\bar{X}_0 : 2.2268 (0.0361)	\bar{X}_0 : 2.2987 (0.0436)	
	\bar{X}_1 : 2.2245 (0.0375) ^{n.s.}	\bar{X}_2 : 2.1439 (0.0538) ^{n.s.}	\bar{X}_2 : 2.1541 (0.3138)*	\bar{X}_1 : 2.2127 (0.0346) ^{n.s.}	\bar{X}_1 : 2.1418 (0.0460) ^{n.s.}	\bar{X}_1 : 2.0995 (0.0371) ^{***}	
Cautiously refusing	\bar{X}_0 : 2.0420 (0.5093)	\bar{X}_1 : 1.8007 (0.1079)	\bar{X}_1 : 2.1450 (0.1539)	\bar{X}_0 : 1.9759 (0.0625)	\bar{X}_0 : 2.2462 (0.0468)	\bar{X}_0 : 2.3716 (0.0544)	
	\bar{X}_1 : 2.1746 (0.4605) ⁺	\bar{X}_2 : 2.1889 (0.0799) ^{***}	\bar{X}_2 : 2.0737 (0.0381)*	\bar{X}_1 : 2.1923 (0.0416)*	\bar{X}_1 : 1.9701 (0.0506) ^{***}	\bar{X}_1 : 1.9233 (0.0420) ^{***}	
Flatly refusing	\bar{X}_0 : 5.0351 (0.5811)	\bar{X}_1 : 5.0478 (0.1438)	\bar{X}_1 : 4.9265 (0.1366)	\bar{X}_0 : 5.0342 (0.0665)	\bar{X}_0 : 4.9124 (0.0440)	\bar{X}_0 : 4.8353 (0.0566)	
	\bar{X}_1 : 4.9365 (0.4459) ^{n.s.}	\bar{X}_2 : 4.8850 (0.0762) ^{n.s.}	\bar{X}_2 : 5.0135 (0.0403) ^{n.s.}	\bar{X}_1 : 4.9448 (0.04179) ^{n.s.}	\bar{X}_1 : 5.0500 (0.0580) ⁺	\bar{X}_1 : 5.0855 (0.0437) ^{***}	
Reasonably rejecting	\bar{X}_0 : 5.0180 (0.5597)	\bar{X}_1 : 4.9913 (0.1467)	\bar{X}_1 : 4.8376 (0.1304)	\bar{X}_0 : 5.0310 (0.0636)	\bar{X}_0 : 4.8814 (0.0415)	\bar{X}_0 : 4.8163 (0.0537)	
	\bar{X}_1 : 4.9210 (0.4155) ^{n.s.}	\bar{X}_2 : 4.8783 (0.0720) ^{n.s.}	\bar{X}_2 : 4.9935 (0.0379) ^{n.s.}	\bar{X}_1 : 4.9232 (0.0389) ^{n.s.}	\bar{X}_1 : 5.0537 (0.0540)*	\bar{X}_1 : 5.0720 (0.0405) ^{***}	
	\bar{X}_0 : 4.3468 (0.5617)	\bar{X}_1 : 4.4891 (0.1296)	\bar{X}_1 : 4.0867 (0.1523)	\bar{X}_0 : 4.3342 (0.0666)	\bar{X}_0 : 4.1949 (0.0496)	\bar{X}_0 : 4.1237 (0.0580)	
	\bar{X}_1 : 4.2269 (0.4871) ^{n.s.}	\bar{X}_2 : 4.2625 (0.0827) ^{n.s.}	\bar{X}_2 : 4.3023 (0.0432) ^{n.s.}	\bar{X}_1 : 4.2420 (0.0449) ^{n.s.}	\bar{X}_1 : 4.3685 (0.0559)*	\bar{X}_1 : 4.3916 (0.0473) ^{***}	

Note: MEKWEF Survey 2017, standard error in parentheses. ^{n.s.} $p \geq 0.1$; ⁺ $p < 0.05$; ^{**} $p < 0.01$; ^{***} $p < 0.005$.

Table 5: Multivariate regression analysis

	Positive and chance-oriented	Critically reflective	Cautiously refusing	Flatly refusing	Reasonably refusing
<i>Socio-demographics</i>					
Woman	0.108(0.074) ⁺	0.156(0.088)*	-0.093(-0.051) ^{n.s.}	-0.080(-0.046) ^{n.s.}	-0.105(-0.054) ^{n.s.}
Age	0.001(0.019) ^{n.s.}	0.005(0.073) ⁺	-0.003(-0.043) ^{n.s.}	-0.002(-0.027) ^{n.s.}	-0.001(-0.011) ^{n.s.}
Education:	0.278(0.110)**	0.306(0.101)*	-0.066(-0.021) ^{n.s.}	-0.061(-0.019) ^{n.s.}	-0.199(-0.060) ^{n.s.}
Lower					
Secondary Education ^a					
Upper	0.031(0.015) ^{n.s.}	0.099(0.039) ^{n.s.}	-0.158(-0.060) ^{n.s.}	-0.102(-0.041) ^{n.s.}	-0.094(-0.034) ^{n.s.}
Secondary Education 1 ^a					
Employment context					
Employed at AEC	0.080(0.053) ^{n.s.}	0.161(0.088)*	-0.080(-0.042) ^{n.s.}	-0.075(-0.042) ^{n.s.}	-0.061(-0.030) ^{n.s.}
Main activity	-0.057(-0.040) ^{n.s.}	-0.183(-0.107)*	0.074(0.041) ^{n.s.}	0.112(0.068) ^{n.s.}	0.104(0.056) ^{n.s.}
Skill enhancement	-0.190(-0.136)**	-0.395(-0.233)***	0.204(0.116)**	0.214(0.130)**	0.244(0.131)***
Further training	2.154***	2.023***	5.085***	4.944***	4.209***
Constant	2.028***	1.712***	5.232***	5.128***	4.413***
N	582	582	582	582	582

Note: MEKWEF Survey 2017, unstandardized (standardized) coefficients.

^aEducational reference group: Upper Secondary Education 2.

n.s., $p \geq 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.005$.

compared only the youngest and oldest subgroup of our sample. Finding a significant mean difference here could be ascribed to a cohort effect. As the regression analysis is multivariate instead of bivariate and the younger adult educators were systematically more highly educated the inclusion of Education into the regression analysis potentially led to a decreasing non-significant (but with $p < 0.10$ at least marginal significant) age effect, where education represents a confounder.

More highly educated adult educators were significantly but with weak effect size ($b_{\text{stand.}} = 0.1$) more critically reflective and positive and chance-oriented. Adult educators who were working at an adult educational center and whose occupation was their second employment were with weak effect size significantly less critically reflective. Here, contrary to the mean comparison tests, adult educators whose occupation was their main employment didn't have fewer rejective attitudes toward digital media than second employed adult educators. Adult educators who took part in further trainings about digital media had consistently, with the results of Table 4, more positive and critically reflective beliefs as well as fewer rejecting attitudes toward the use of digital media in adult learning scenarios. The strongest standardized effect size loaded here with $b_{\text{stand.}} = 0.233$ on the critically reflective attitude scale. All other standardized effect sizes were with $b_{\text{stand.}} = 0.13$ much weaker. Overall, there was evidence for systematic and structural differences between subgroups. Educational attainment, the employment context as well as skill development, correlated to and had an influence on positive attitudes toward digital media.

Discussion

The aim of this study was to analyse differences in adult educators' attitudes as the cause of low use of digital media. Based on the assumption that attitudes can be traced back to the biographically acquired habitus, the relationships to socio-demographic differences were investigated. Differential aspects such as the age of the adult educators, different educational backgrounds and employment relationships of adult educators, as well as the participation of the adult educators in media-related training courses were analysed to see which socioeconomic factors have a positive or negative influence on attitudes toward media.

Also, the underlying statistical analysis had to deal with some limitations. The sample was potentially biased, because it took place as a self-administered online survey with only one year of observation. Hence, only cross-sectional effects were estimable. Purely desirable individual socio demographic effects using fixed effects regression analysis were not estimable and unobserved heterogeneity could not be precluded (Brüderl & Ludwig, 2015). It can also be assumed that there has been a shift in the use of media toward more digital media. Also, it should be considered that educators who completely reject digital media are unlikely to participate in an online survey.

The results from the present study suggest that adult educators who have a higher level of educational attainment, as presumed, deal with the media in a more critically reflective manner. This result is not surprising: that higher education tends to have a positive influence on the development of critical thinking. These adult educators were also more opportunity oriented. Moreover, the results suggest that adult educators who take part in media-related training courses deal with the media more critically and reflectively and less refusing or rejecting. However, it cannot be inferred from the data whether these attitudes were already present before the further training and influenced the decision to take part in further training, or whether the further training had a positive influence on the ability to reflect.

Moreover, adult educators who worked in adult education centers were less critically reflective. At this point, the question arises as to why these adult educators in particular may express themselves less openly and reflectively toward digital media. In addition, the question must be asked whether it is the task of public adult education to impart general media competence and, if so, whether there is a need for reflection

in the area of media-related attitudes so that this promotion of media competence can take place. These normative questions must be clarified above all at the political and organizational level so that appropriate recommendations for action can be developed for adult educators.

The assumption that younger adult educators tend to be more open, opportunity oriented and critically reflective than older adult educators has not been confirmed. It is more evident that the general teaching experience has a positive influence on attitudes. At this point, a more detailed survey should be conducted to determine whether teaching experience can be traced back to a more frequent use of digital media in one's own teaching, or whether even adult educators who do not primarily use any media in their teaching have a critically reflective attitude. As teaching experience usually increases with age, this may explain why age alone is not an explanatory factor. In the same way, adult educators who work as their main occupation in adult education tended to be more critically reflective in the use of media. This could be attributed to the fact that general didactic experience leads to a generally more critical reflection of the didactic setting, which could also affect the use of digital media.

Conclusion and recommendations for practice

The present study suggests that that the heterogeneous landscape of adult education is also reflected in the media-related attitudes of adult educators. The results show that there are favorable factors for positive and critically reflective attitudes toward the media, such as educational background, employment, age and media-related continuing education.

If the aim of adult education is to establish media more strongly in adult education, then a more open attitude toward media on the part of adult educators could be helpful. In order to achieve this, reflection processes would have to be supported in the case of adult educators who are more generally opposed to digital media, so that the decision as to whether digital media should be used would be based on the subject of learning and not be rejected generally on the basis of digitality. The results show links to enhance the professional use of digital media in further education. In order to make such professionalization paths profitable, further investigations should be carried out into the influencing factors of attitudes on media-related teaching. For this purpose, qualitative studies should on the one hand explore individual attitudes and media habits of adult educators, and quantitative studies should on the other consider media-related attitudes in relation to media-related actions. For future quantitative research, a better data basis in the form of longitudinal data with repeated measures of the same individuals is needed to estimate the regression models more precisely and unbiased, to test for the time variability of the dependent attitudes and to preclude unobserved heterogeneity.

However, reflection processes cannot be expected to reduce all rejection. There may be conscious and reflected rejection of media by adult educators who maintain it. Nevertheless, the broader consideration of attitudes and values can lead to the identification of reasons that close the gap in media-related attitudes and reduce unfounded resistance to digital media slightly if corresponding media-related incentives for reflection are developed for adult educators. A better understanding of which factors have a formative influence on the media-related attitudes and values toward digital media of adult educators could act as an incentive point to develop special impulses for media pedagogical professionalization, which are designed according to the special target groups.

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Appendix

Table A1: Item-wordings and indexes usage of adult educators attitudes toward digital media

Item wordings	Scales	Indexes item usage
(1) Digitale Medien sind eine Möglichkeit meine Lehre vielseitiger zu gestalten. [Use of digital media is one way to make my teaching more versatile.]	(1) Fully applies-(6) does not apply at all	Positive and chance-oriented Critically reflective
(2) Ich nutze digitale Medien in der Lehre um meinen Teilnehmenden auch neue Wege des Lernens nahe zu bringen. [I use digital media to teach my participants new ways of learning.]	(1) Fully applies-(6) does not apply at all	Positive and chance-oriented Critically reflective
(3) Durch die digitalen Medien haben sich die Zugänge zu Lernmöglichkeiten vereinfacht. [Digital media have simplified access to learning opportunities.]	(1) Fully applies-(6) does not apply at all	Positive and chance-oriented
(4) Die Vielfalt der digitalen Lernmöglichkeiten kann für viele Lernende eine Überforderung darstellen den eigenen Lernprozess zu gestalten. [The variety of digital learning possibilities can be an overstrain for many learners to design their own learning process.]	(1) Fully applies-(6) does not apply at all	Positive and chance-oriented (scale inverted)
(5) Es ist gut, dass immer mehr Inhalte im Internet verfügbar sind, die ich für meine Lehre nutzen kann. [It is good that more content is available on the Internet that I can use for my teaching.]	(1) Fully applies-(6) does not apply at all	Reasonably rejecting Positive and chance-oriented
(6) Mir macht es Spaß neue digitale Medien in meiner Lehre auszuprobieren. [I enjoy trying out new digital media in my teaching.]	(1) Fully applies-(6) does not apply at all	Positive and chance-oriented
(7) Ich finde im Internet meistens etwas, dass ich für meine Lehre einsetzen kann. [I usually find something on the Internet that I can use for my teaching.]	(1) Fully applies-(6) does not apply at all	Positive and chance-oriented
(8) Ich nutze das Internet für die Suche nach Materialien für meine Lehre. [I use the Internet to search for materials for my teaching.]	(1) Fully applies-(6) does not apply at all	Positive and chance-oriented
(9) Über die Inhalte meiner Lehre informiere ich mich über das Internet. [I inform myself about the contents of my teaching via the Internet.]	(1) Very often-(6) never	Positive and chance-oriented
(10) Wenn von mir der Einsatz digitaler Medien erwartet wird, setze ich diese auch ein. [If the use of digital media is expected of me, I also use it.]	(1) Fully applies-(6) does not apply at all	Positive and chance-oriented
(11) Ich habe keine Bedenken gegen den Einsatz digitaler Medien in Lehr-/Lernprozessen. [I have no reservations about the use of digital media in teaching/learning processes.]	(1) Fully applies-(6) does not apply at all	Positive and chance-oriented
(12) Wenn ich digitale Inhalte für meine Lehre einsetze, überprüfe ich die Quellen und Inhalte. [When I use digital content for my teaching, I check the sources and content.]	(1) Very often-(6) never	Critically reflective

Table A1: Continued

Item wordings	Scales	Indexes item usage
(13) Ich setze digitale Medien in meiner Lehre ein, wenn sie einen Mehrwert für die Teilnehmenden bieten. [I use digital media in my teaching if they offer added value for the participants.]	(1) Fully applies-(6) does not apply at all	Critically reflective
(14) Ich setze digitale Medien in der Lehre in Bezug zur Arbeits- und Lebenswelt der Teilnehmenden ein. [I use digital media in teaching in relation to the working and living environment of the participants.]	(1) Fully applies-(6) does not apply at all	Critically reflective
(15) Ich reflektiere die Wirkung des Medieneinsatzes in meinem Lehrangebot. [I reflect on the effect of the use of media in my courses.]	(1) Fully applies-(6) does not apply at all	Critically reflective
(16) Digitale Kommunikationsformen mit meinen Teilnehmenden sind mir zu unpersönlich. [Digital forms of communication with my participants are too impersonal for me.]	(1) Fully applies-(6) does not apply at all	Cautiously refusing Reasonably rejecting
(17) Die Auswirkungen der Digitalisierung auf die Arbeitswelt machen mir Angst. [The effects of digitization on the world of work frighten me.]	(1) Fully applies-(6) does not apply at all	Cautiously refusing Flatly refusing
(18) Ich habe Angst, dass die digitalen Entwicklungen meine Rolle als Lehrender überflüssig machen. [I am afraid that digital developments will make my role as a teacher superfluous.]	(1) Fully applies-(6) does not apply at all	Cautiously refusing Flatly refusing
(19) Es ist notwendig sich gegen die technologischen Entwicklungen in der Pädagogik zu wehren. [It is necessary to defend oneself against technological developments in pedagogy.]	(1) Fully applies-(6) does not apply at all	Cautiously refusing Flatly refusing
(20) Digitale Medien sind für meine Lehre überflüssig. [Digital media are superfluous for my teaching.]	(1) Fully applies-(6) does not apply at all	Cautiously refusing Reasonably rejecting Flatly refusing
(21) Bei Inhalten aus analogen Medien kann ich mir sicherer sein, dass sie eine hohe Qualität für meine Lehre haben, als bei digitalen Medien. [With content from analogue media I can be sure that it has a higher quality for my teaching than with digital media.]	(1) Fully applies-(6) does not apply at all	Cautiously refusing Reasonably rejecting Flatly refusing
(22) Ich sehe für meine Angebote keine Notwendigkeit der Auseinandersetzung mit digitalen Medien. [I do not see any necessity for my offers to deal with digital media.]	(1) Fully applies-(6) does not apply at all	Flatly refusing
(23) Für meine Veranstaltungen bringt der Einsatz digitaler Medien keinen Mehrwert. [For my events the use of digital media brings no added value.]	(1) Fully applies-(6) does not apply at all	Reasonably rejecting

Question Wording: To what extent do the following statements apply to you?

Note: the original wording was in German and English translations are given in square brackets.