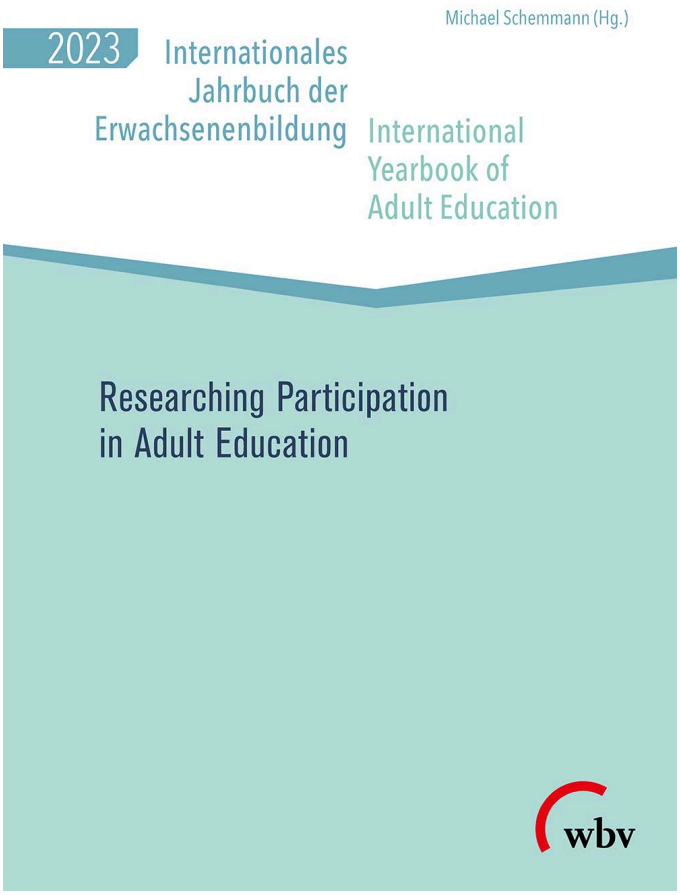

E-Journal Einzelbeitrag
von: Tim Vetter, Gwennaëlle Mulliez, Eva Bonn

Between Anything Goes and Methodical Rigor

An Empirical Analysis of Systematic Literature Reviews in Adult Education Research

aus: Internationales Jahrbuch der Erwachsenenbildung / International Yearbook of Adult Education 2023
(9783763973910)
Erscheinungsjahr: 2023
Seiten: 141 - 160
DOI: 10.3278/I73910W008

In den letzten zwei Dekaden hat die Verwendung von Systematic Reviews (SRs) im Kontext der Erwachsenenbildungsforschung vor dem Hintergrund der Debatte um Evidenzorientierung zugenommen. Hieran anknüpfend untersucht der vorliegende Beitrag die Implementierung der Methode innerhalb der Disziplin. Ausgehend von einem integrativen Review (IR) konnten 57 erwachsenenpädagogische SRs ermittelt werden, die anschließend mittels eines ausdifferenzierten Kodiersystems analysiert wurden. Die Befunde verweisen auf unterschiedliche Ausprägungen methodischer Fundierung in der Anwendung der Methode des SRs. Der Beitrag soll den Grundstein zur weiterführenden methodischen Reflexion zu SRs in der Weiterbildungsforschung legen.

Within the past two decades, the use of systematic reviews (SRs) in the context of adult education research has increased against the backdrop of the debate on evidence orientation. Following on from this, this paper examines the implementation of the method within the discipline. Based on an integrative review (IR), 57 adult education SRs were identified and subsequently analyzed using a differentiated coding system. The findings point to varying degrees of methodical grounding in the application of the SR method. The article forms the starting point for further methodological reflection on SRs in adult education research.

Schlagworte: Systematic Review; Adult Education; Integrative Review; Research Method Reflection; Erwachsenenbildung; Integrativer Review; Forschungsmethodische Reflexion
Zitiervorschlag: *Vetter, Tim; Mulliez, Gwennaëlle & Bonn, Eva (2023). Between Anything Goes and Methodical Rigor. An Empirical Analysis of Systematic Literature Reviews in Adult Education Research. In: Internationales Jahrbuch der Erwachsenenbildung 2023. Researching Participation in Adult Education, S. 141-160. Bielefeld: wbv Publikation. https://doi.org/10.3278/I73910W008*

Between Anything Goes and Methodical Rigor – An Empirical Analysis of Systematic Literature Reviews in Adult Education Research

Tim Vetter, Gwennaëlle Mulliez & Eva Bonn

Abstract

Within the past two decades, the use of systematic reviews (SRs) in the context of adult education research has increased against the backdrop of the debate on evidence orientation. Following on from this, this paper examines the implementation of the method within the discipline. Based on an integrative review (IR), 57 adult education SRs were identified and subsequently analyzed using a differentiated coding system. The findings point to varying degrees of methodical grounding in the application of the SR method. The article forms the starting point for further methodological reflection on SRs in adult education research.

Keywords: Systematic Review; Adult Education; Integrative Review; Research Method Reflection

Zusammenfassung

In den letzten zwei Dekaden hat die Verwendung von Systematic Reviews (SRs) im Kontext der Erwachsenenbildungsforschung vor dem Hintergrund der Debatte um Evidenzorientierung zugenommen. Hieran anknüpfend untersucht der vorliegende Beitrag die Implementierung der Methode innerhalb der Disziplin. Ausgehend von einem integrativen Review (IR) konnten 57 erwachsenenpädagogische SRs ermittelt werden, die anschließend mittels eines ausdifferenzierten Kodiersystems analysiert wurden. Die Befunde verweisen auf unterschiedliche Ausprägungen methodischer Fundierung in der Anwendung der Methode des SRs. Der Beitrag soll den Grundstein zur weiterführenden methodischen Reflexion zu SRs in der Weiterbildungsforschung legen.

Schlagworte: Systematic Review; Erwachsenenbildung; Integrativer Review; Forschungsmethodische Reflexion

1 Introduction

The thorough preparation of the state of research on a subject of interest, both in theoretical and empirical terms, can be understood as a cross-disciplinary common sense in

the process of gaining scientific knowledge. However, approaches to the collection, processing and presentation of current academic knowledge on a specific topic are diverse and usually diverge in terms of their degree of systematization. Methodical approaches to achieve the highest possible degree of systematization are systematic reviews (SRs), which have their origin in evidence-based medical research (EBM). This methodical procedure is linked to the claim to process the state of knowledge on clearly defined problems on the basis of collected empirical evidence that meets predefined selection criteria and freeing it from possible biases in order to generate empirically more robust decision-making knowledge (cf. Higgins et al. 2019, p. xxiii). Within the last one to two decades, there has also been a lively interest in SRs and their potential outside of EBM. In the meantime, various efforts to claim the method in different ways for diverse topics of adult education can be identified. For instance, experiences from employees with team learning in a vocational learning or work setting (Hannes et al. 2013), the transfer of vocational education and training (Toepper et al. 2022), the identification of factors of successful language acquisition in the context of functional illiteracy (Sahlender & Schrader 2017), explorations of the concept of innovation (Koller 2021) or the investigation of interaction interfaces between personnel groups in adult education (Goeze & Stodolka 2019) are examined.

However, while there is a consensus regarding the respective research objects and the epistemological interests in medicine and in natural sciences in general, this is not the case for research in the field of adult and continuing education – at least in its entirety (cf. Rubenson & Elfert 2015). The lack of fundamental reflections on the conditions under which the 'import' of SRs as a method seems appropriate can be considered a desideratum and marks a starting point for the present study, which aims at analyzing the methodological application of SRs. Thus, this paper addresses the following question: How is the method of systematic review adapted in the research field of adult and continuing education?

The paper takes its point of departure by discussing the methodical roots of SRs explaining issues of its adaptation in educational science in general and in adult education research in particular taking into consideration the specifics of these research fields (chapter 2). In order to address the research question, an integrative review (IR) is conducted which is further described in chapter three. Based on the methodical explanations, the paper then continues by presenting and discussing the essential results (chapter 4) and finishes off with a conclusion and an outlook on further research (chapter 5).

2 Systematic Reviews and Adult Education Research – Positioning the Method in the Research Field

A SR can be defined as a method to systematically search, evaluate, and synthesize all relevant research on a specific research question by means of explicit and reproducible methods to minimize bias. It is a way of comprehensively and transparently summariz-

ing the current state of evidence on a particular topic, with a focus on randomized controlled trials (RCTs) as the highest level of evidence (cf. Chandler et al. 2022).

Looking at systematic reviews in the context of EBM, it becomes obvious that there are several special features of and developments in this research field contributing to a strong entrenchment of SRs as a research method. SRs have been institutionally established in medical research by the Cochrane Collaboration founded in 1993 (cf. Altman & Burton 1999) aimed at making information and evidence on therapeutical issues broadly available, facilitating medical decisions and informing patients through preparation, continual updating and dissemination of systematic overviews (cf. Blümle et al. 2009, p. 88; cf. Antes & Oxman 2009, p. 448). The relevance of SRs in medical research is also displayed by corresponding funding programs (e. g. BMBF 2013). Furthermore, SRs are applied quite naturally in medical research due to the overall paradigm of evidence-based research.

This is certainly quite different in educational and therefore also in adult educational research as a subdiscipline. Educational research has been confronted with calls for a stronger evidence-orientation coming from educational policy and the rather young field of empirical educational research has indeed readily apprehended this development (cf. Schrader 2014, p. 194). Still, the debate on evidence-based educational research is quite controversial within the educational research community. Proponents for instance point to improvements of subject-related and methodical expertise induced by competitive situations in the scientific community that have evolved around evidence-oriented objectives (cf. ibid., p. 210). Simultaneously, critical voices warn against a functionalist appropriation of educational research on part of educational policy-makers (cf. e. g. Bellmann 2017). Common sense among researchers only seems to exist with regard to the conviction that an unreflected adaptation of scientific practices and paradigms from EBM cannot meet the specific requirements of educational research.

Even though the critical reflection of the beginnings of evidence-based research in educational sciences, starting off with PISA and incentives from educational policy (cf. Baumert et al. 2002), can rather be seen as a self-reflection of the respective actors, SRs being essentially connected to the paradigm of evidence-based research can still provide an additional value to educational research. However, the specifics of educational research need to be taken into consideration here. According to Smith and Keiner (2015), it can currently be observed that there are attempts of imitating methods from natural sciences based on the evidence levels in educational research (cf. p. 666). Problems of these imitation attempts become most obvious regarding the focus on RCTs. There are voices defending RCTs not only as a standard for educational policy programs and strategies but even as a gold standard of the current educational scientific profession (cf. ibid.). Nevertheless, two points of criticism in particular illustrate the need for a critical approach to such studies in educational science. First, in contrast to medicine, educational research rarely offers the possibility to conduct laboratory studies. These can rather be found in cognitive psychology next to experimental designs (cf. Schrader & Berzbach 2005, p. 30). The aspect of control in the context of RCTs in educational research is therefore often characterized by mutually dependent, confounded

variables (cf. Smith & Keiner 2015, p. 670). Second, the operationalization of success criteria is not as clear in educational research as it might be in medical research. While medical RCTs provide clear indicators for success, desirable outcomes of an educational RCT must first be operationalized. For example, educational success or competence development need to be operationalized and measured by means of different sub-categories while medical RCTs can often observe clear effects (e. g., lower blood pressure).

This also has far-reaching consequences regarding the relation between science and educational and social policy. While health policy can convert objective insights from an RCT into practical laws, regulations or recommendations, this cannot be done in the field of education without critically evaluating the definition of benchmarks and success factors. Evidence-based policy, that is, the deliberate use of the best evidence in processes of decision making among policy options (cf. Burns & Schuller 2007, p. 16), therefore faces increased complexity in education. Despite these difficulties, the field of educational research attempts to bridge the gap between the method of SRs and the specific field of educational research (see e. g., Newman & Gough 2020).

The criticisms described above are currently being discussed within the discipline of educational science in the context of a methodological debate on the fit, usefulness and implementation of SRs, as exemplified by the anthology by Zawacki-Richter et al. (2020). In the context of the volume, critical methodological reflections on the method within the discipline are formulated, emphasizing, for example, the necessary attention to other review forms besides SRs in order to counter the problems of an unreflected methodological adoption as described (cf. Hammersley 2020).

3 Methodical Design

The present study aims at exploring how SRs are employed as a research method in the field of adult education research. It intends to gain a comprehensive and preferably unbiased picture of the *status quo* of the application of SRs in adult education research. Therefore, independent from the methodical quality, all kinds of empirical studies in the field of adult education research that report conducting a SR are included in the present review indicating the adequacy of an integrative review (IR) approach in this context.

Contrary to SRs, IRs allow for the inclusion of both experimental and non-experimental studies. The IR "[...] combines data from theoretical and empirical literature, and has a wide range of purposes, such as definition of concepts, review of theories and evidence, and analysis of methodological problems of a particular topic" (Tavares de Souza et al. 2010, p. 103). However, the rather large methodical scope for interpretation and application compared to SRs needs to be viewed critically with regard to potential biases and a lack of stringency (cf. Whittemore & Knafl 2005, p. 548, Toronto & Remington 2020). Whittemore and Knafl (2005) therefore developed a five-step process model aiming at ensuring a systematic and standardized application of the method. The first phase comprises the definition of the guiding question(s) for the review while

the second phase continues with the literature search. In the third phase, the data produced through the literature search is evaluated with the use of predefined quality indicators. Phase four includes the data analysis which can vary in terms of the analytical categories depending on the research question and objectives. Finally, the results are presented in a structured manner in phase five (cf. ibid., pp. 548–552). As the guiding question for the present study (phase 1) has already been presented in chapter one, the following explanations will focus on describing the phases 2 to 4 as conducted in this review.

Two search strategies were used in the search procedure of this study including a database search and a manual examination of relevant international journals in the field of adult education research. Complementing the database search by a manual search can be considered an essential methodical step as it helps identify studies that would otherwise not become visible through database searches only (cf. Booth et al. 2022, p. 140).

The database search was conducted from August 29th to 30th, 2022 by the first author who has profound experiences in working with selected databases based on previous review projects. A total of five databases of interdisciplinary and pedagogical contexts and disciplines related to pedagogy, which are considered standard sources in their research contexts, were considered (ibid., pp. 129 ff.). All databases were searched via the advanced search tool using the search term (fig. 1) in order to look for papers whose title, abstract or keywords indicated that a SR was conducted in the context of adult education research. The search string was constructed by initially collecting synonyms for 'adult education' and 'systematic review' and then combining these terms (both in English and German).

```
TITLE, ABSTRACT, KEYWORDS ("adult education" OR "adult learning" OR "further education" OR
"continuing education" OR "lifelong learning" OR "life-long learning" OR "lifelong education" OR "life-
long education" OR "vocational learning" OR "vocational education" OR "vocational training" OR
"andragogy" OR "Erwachsenenbildung" OR "Weiterbildung" OR "Fortbildung" OR "berufliche Bildung"
OR "betriebliche Bildung" OR "lebenslanges Lernen" OR "lebensbegleitendes Lernen" OR
"erwachsenenpäd*" OR "Andragogik") AND TITLE, ABSTRACT, KEYWORDS ("systematic review"
OR "systematic literature review" OR "systematisches review" OR "systematische Literaturrecherche")
```

Figure 1: Search string

As explained in chapter two, upcoming debates on evidence orientation in adult education research suggest that SRs have only recently been adapted in this research field. Therefore, the selection of studies was not limited with regard to publication dates. During the browsing search conducted on September 20th, 2022, nine journals were identified that are either listed in the Journal Citation Report or in the SCImago Journal & Country Rank and that can be explicitly assigned to adult education research (cf. Vetter 2022, p. 111). Since the German adult education research context is considered, two renowned German journals were included in the manual search in addition to the International Yearbook of Adult Education. The flow diagram (fig. 2) presents all data-

bases and journals included in the search along with the respective number of identified studies.

Duplicates were then removed and the resulting pool of literature was screened using the following inclusion and exclusion criteria. All empirical studies were included that were published as monographs, journal articles, or edited volume contributions in German or English and that, according to their own statements, conduct a SR in the context of adult education as a central or accompanying method. On the other hand, articles were excluded that were published in other languages, did not conduct a SR or that conducted other forms of review, such as a scoping review or thematic review, or belonged to research disciplines other than adult education research.

The final number of identified studies relevant to the guiding question were then analyzed by means of qualitative coding (phase 3 and 4). In order to evaluate the application of SR in international adult education research, the quality indicators for SRs presented by Talbott et al. (2018) were modified and adapted as a coding framework. For their field of interest, namely special education, the authors note that despite an overall international orientation towards evidence-based practice, there are still no quality criteria for SRs (cf. ibid., p.1). Against this background, they develop 43 quality indicators for SRs classified in five process phases. The resulting quality framework was adapted for the field of adult education research and inductively condensed in order to serve as a reliable coding framework for the present study (tab. 1). As with Talbott (2018), independent subcategories were binary coded ("present"/"absent"). Only the subcategory "Research Question" was coded tripartitely ("Implicit Research Question", "Explicit Research Question", "No Research Question"). The criteria catalogue by Talbott et al. (2018, pp. 20 ff) on the one hand fits the field of adult education and on the other hand provides a differentiated systematization of the SR method based on methodical standard works.

Regarding the coding process, the coding framework was initially tested with three articles in the context of a coding workshop. Following, overall 30 studies were double-coded by the authors and Cohen's Kappa was calculated in order to determine the interrater-reliability. The determined value was $\kappa = 0.90$ and thus can be considered "almost perfect" (Landis & Koch 1977, p. 165). Any coding differences were discussed and consensually resolved among the authors. Due to the high interrater-reliability and based on the further development and specification of the coding framework, the remaining studies were then single-coded by the authors.

The final analysis of this IR is divided into a part with overarching findings and five sub-segments oriented towards the superordinate categories of the coding framework. Since the analysis aims at an exploration of the application of SRs in the *field* of adult education research and not on an analysis of the methodical quality of single studies, the results are presented focusing on comprehensive observations and the studies are referred to by anonymized codes. An overview of all anonymized SRs and their assigned codes as well as the reference list of the coded articles are provided as a separate document in a repository.[1]

1 *Link to the document*: https://doi.org/10.57743/891

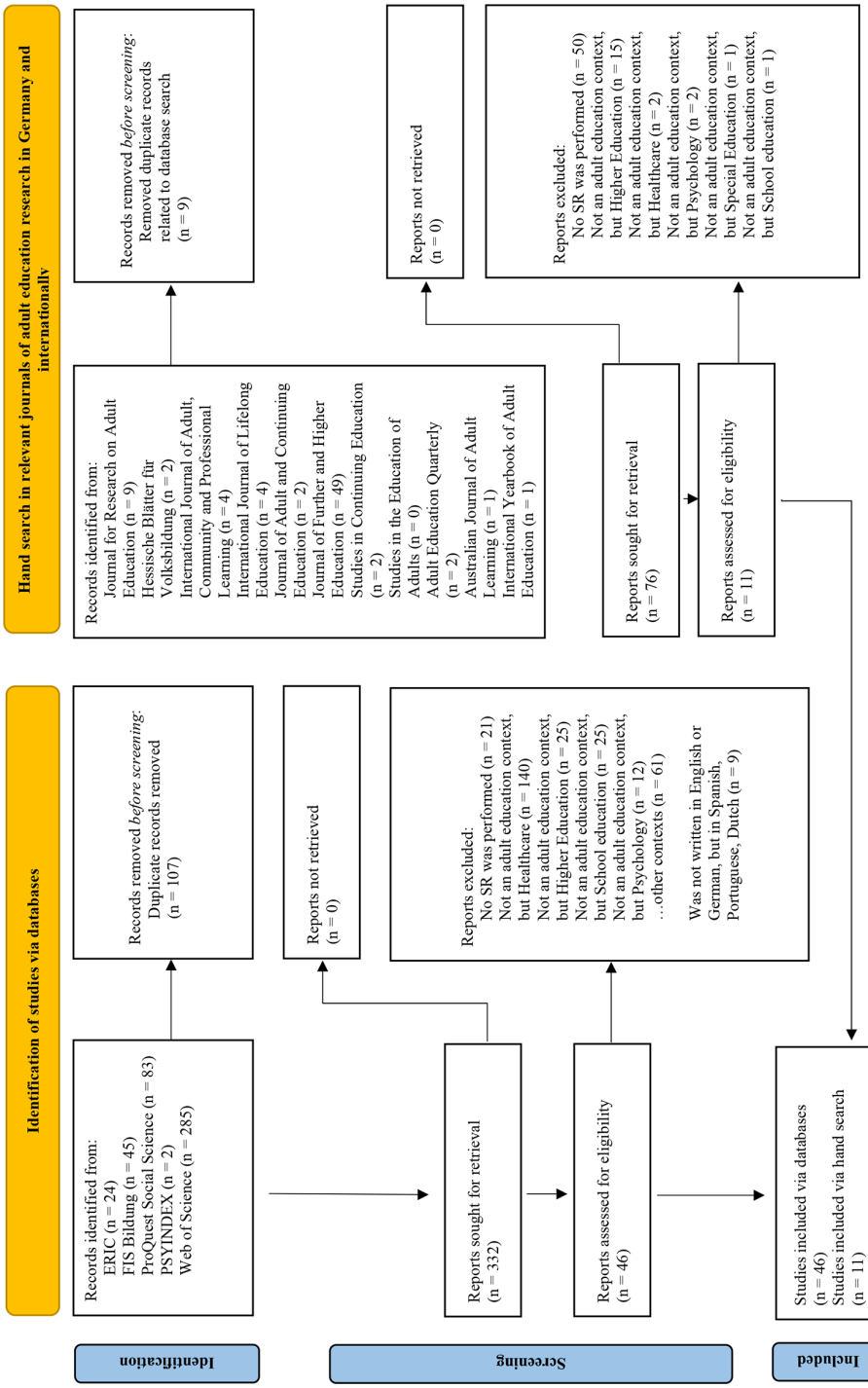

Figure 2: PRISMA flow diagram for the search procedure

Table 1: Coding Scheme and Code Definitions (adapted version based on Talbott et al. 2018)

Criteria designation	Coding condition
Evaluation of the guiding research question	
Implicit Research Question	If only an intention or topic formulation is formulated without a precisely answerable question.
Explicit Research Question	If a sentence can be found that hast he grammatical strucutre of a precise question.
No Research Question	If the article is based neither on an intention or topic formulation nor an explicit question.
Inclusion and Exclusion Prodcedures	
Population Defined	Only if research design is reported.
Research Designs Reported	Only if review refers to empirical studies and if specified which forms of empirical work were included.
Time Constraints Reported	If a timeframe is reported, no justification for setting the frame needed.
Search Procedures	
Databases Identified	If complete, explicit naming of all searched databases.
Unpublished Studies Included	If explicitly reported that unpublished studies were included.
Search Keywords Reported	If complete, explicit naming of al search terms used is listed.
Date of Implementation Reported	If execution date is reported for the search.
Hand Search Reported	If additional searches based on bibliographies or using the snowball principle is explicitly reported.
Inclusion of Thematic SLR	If explicitly formulated that thematic SRs were taken into account.
Subject Matter Experts Consulted	If additional researchers or institutions were contacted to identify invisible/hidden or internal studies.
More Than One Languages Included	If more than one language was considered in the search.
Abstracts Reviewed	If abstracts were screened.
Qualifications of Searchers Reported	If explicitly reported what kind of qualification the searchers have.
Study Retrieval Procedures	
Number of Studies Identified Reported	If the number of overall studies identified through the searches is reported.
Number of Studies Excluded Reported	If explicitly stated how many studies were excluded.
Number of Studies Retrieved	If the number of studies used in the further evaluation process of the SR is reported.

(Continuing table 1)

Criteria designation	Coding condition
Exclusion Criteria Reported	If arguments/aspects/criteria are named that lead to the inclusion of a study in the further SR procedures.
Inclusion Criteria Reported	If arguments/aspects/criteria are named that lead to the exclusion of a study in the further SR procedures.
Reliability of Screening Procedures	If a specific reliability value is reported.
Process for Resolving Disagreements	If a procedure for handling nonconformity during the screening process is described.
Coding Scheme Procedures	
Coding Scheme Reported	If an explicit coding scheme is reported and defined.
Coder Expertise Reported	If a procedure that provides information on the qualification of the coder is described.
Reliability of Coding Scheme Reported	If a specific reliability value is reported.
Process for Resolving Disagreements	If a procedure for handling nonconformity during the screening process is described.
Data Analysis Plan	
Data Analysis Plan Reported	If the use of a methodologically sound procedure to analyze date from SR is described.

4 Results and Discussion

As shown in the PRISMA flow diagram (fig. 2), a total of 57 papers were identified that conducted SR in the context of adult education research. Three papers (Cenka et al. 2022, Handzic et al. 2017 and Ioannidou & Parma 2022) did not use SR as the central method of the study, but as an accompanying tool. Since it is likely that accompanying methods are not described as detailed and the underlying measurement tool relies on a comprehensive description of the methodical approach of the studies under review, the three aforementioned papers were excluded from the analysis. A rough thematic clustering of the publication venues of all identified articles shows that the majority of the identified journals fall into one of three groups. The largest of these groups consists of journals with a clear focus on adult education and (vocational) training (n = 26), followed by a group of journals that focus on information and communications technology (ICT) in relation to educational topics (n = 10), and finally journals that focus on topics of broad educational research (n = 8).

In the following, the findings of the present analysis are presented and discussed along the five phases of an SR. Preceding the phases is a subchapter that addresses the

transverse category of the research question. The chapter will close with cross-categorical findings.

4.1 Research Question

As with all other empirical methods, the formulation of a precise guiding research question plays a decisive role, as specific, measurable, achievable, and time-bounded goals are co-formulated here (cf. Alves 2018, p. 184). Especially for SRs, the development of a research question is crucial (cf. Thomas et al. 2019, p. 13). Thus, it is even more surprising that not all identified SRs in adult education research operate with a decidedly formulated and clearly identifiable research question. The 12 (22.22 %) papers that use an implicit research question achieve an average of only $\mu = 9.1$[2] codes. In contrast, the SRs with one or more stated questions reach a value of $\mu = 13.2$ codes. Although the coding was purely descriptive, the findings indicate that an implicit question also results in inaccuracies affecting the following steps of an SR.

4.2 Inclusion and Exclusion Procedures

A clearly defined and designated scope is important to keep the SR manageable and timely (cf. Garritty et al. 2021, p. 15). This paper focuses on the relevant population/target group, the relevant study designs, and the relevant time frame that the SR should cover. Looking at the first two codes, it is noticeable that very few studies make use of these narrowing options ($n = 8$, $n = 12$). Of the 8 papers that report a specific population/target group, all received above-average numbers of codes and, except for Doc_8, also reported a study design that goes beyond the rough designation of 'empirical studies'.

In turn, a temporal containment framework is indicated by 43 studies. A closer look at these contributions reveals that the majority ($n = 25$), such as Doc_7 or Doc_33, do not justify the set frame. 17 contributions, on the other hand, choose a substantive or thematic justification while 4 contributions mention a research pragmatic justification. An explicit justification of a temporal containment frame is important for reasons of transparency. This includes reasons why the decision was made not to use the temporal constraint. To make no statements at all about this limitation criterion, as is the case with 6 studies in the present sample, is detrimental to the replicability of the study and in this way to its scientific quality.

4.3 Search Procedures

This category in the coding guide is of particular relevance for the replicability of SRs. In addition, very basic components of a SR are collected here, which are also common to other review forms and are considered in all reporting guidelines for reviews (cf. Booth et al. 2022, p. 326).

While codes in this category are frequently assigned, considering their low-threshold nature and their basic methodical function, the numbers still seem rather low. 13

2 To avoid too much bias due to extreme values, the average is replaced by the 10 % trimmed mean. To calculate the 10 % trimmed mean, the top and bottom ten percent of cases are removed.

(24.07 %) of all SRs identified in adult education research do not explicitly mention all databases consulted. 15 (n = 27.78 %) do not publish the complete list of search terms used, let alone the search string. In this way, neither an assessment regarding the operationalization of the guiding question of the SR, nor the replicability is guaranteed.

With regard to the integration of multilingual articles within the SRs, it is noticeable that only 7 (12.96 %) include more than just English or German articles. This finding suggests that especially those articles are at risk of a language bias (cf. Song et al. 2010), which do not investigate localized questions. Language bias in the context of systematic reviews describes the phenomenon that many results remain invisible due to the focus on one language in the context of the inclusion and exclusion criteria depending on the guiding research question. In a SR, this can lead to biased results. For SRs in the field of social science, the identified language bias is due to a lack of resources, forcing review teams to rely on their limited language skills rather than the assistance of professional translators (cf. Rasmussen & Montgomery 2018). This finding also seems applicable to the field of adult education research.

Within the Search Procedures category, those categories that are not implemented in all sub-forms of the Reviews family of methods, and in this way maximize the degree of systematization of the data base, are particularly noticeable. In addition to the thematic inclusion of contributions in different languages, these are the consideration of unpublished studies (n = 3), the consideration of SRs that also have a thematic relevance for one's own review (n = 4), the contacting of potential authors (experts) to identify possible publications (n = 3), qualifications of the searchers are reported (n = 0), and a complementing manual search (n = 22). Since the latter criterion was assigned comparatively frequently, a more detailed analysis is necessary here. While six papers did not report how many relevant findings could be generated via manual search, the remaining SRs reported between 3 and 115 relevant hits generated e. g. via manual search in relevant journals and conference papers or manual review of reference lists. In 7 SRs, even different strategies of manual search were combined. Depending on the research question, manual search strategies can increase the number of hits, e. g. when investigating new trend topics in adult education.

4.4 Study Retrieval Procedures

To identify appropriate studies, researchers must first conduct a search of databases and other sources, reviewing each title and abstract to create an initial pool of studies for further review, then followed by a full-text evaluation (cf. Papaioannou et al., 2010, p. 119; Talbott et al. 2018, p. 10). The hit counts thus reduced are usually presented via the PRISMA flowchart (cf. Page et al. 2021, p. 5). Here, it is particularly important not only to show the excluded studies numerically, but also to name the reasons for exclusion based on the exclusion criteria.

In the present sample of SRs in the context of adult education, it is noticeable that not all contributions show the number of data in the unadjusted corpus, the number of excluded studies, and the number of studies identified as relevant. In light of the transparency claims of empirical methodology, this is noteworthy.

Regarding the identification of inclusion and exclusion criteria, five contributions stand out that do not identify any criteria at all. 4 of these 5 contributions only show an implicit question. This finding raises the question of the extent to which implicit questions can be investigated using SR. One paper reports implicit inclusion criteria, but the description at this point is not sufficient to replicate the study.

The reporting of a reliability value of the screening process (n = 5, 9.26 %) and the report of handling disagreements in the screening process (n = 11, 20.37 %) suggests that a large proportion of SRs studied rely on the estimation of a single person for the screening process. However, for SRs, it seems advisable to test the inclusion and exclusion criteria, as it is common for coding processes.

4.5 Coding Scheme Procedures

The coding procedure is an essential step in preparing the data retrieved from the searching phase. Based on Talbott et al. (2018), the relevant quality indicators for this phase include reporting a coding scheme, reporting the qualification of coders as well as the reliability of the coding scheme and reporting how disagreements were handled in the coding process. Coding schemes for systematic reviews can refer to study quality, describing the participants and setting of the identified studies and/or to describing the variables under study (cf. Talbott et al. 2018, p.10).

In our corpus, 35 out of 54 studies report a coding scheme. Considering that the coding procedure is an integral step of SRs, it is quite astonishing that only about 65 % of the studies applying this method follow this guideline. A closer analysis of the coding schemes in our study corpus shows that the coding procedure itself is conducted quite differently across the studies. In eight studies, the coding scheme serves to evaluate the study quality. However, the quality-related coding does not necessarily relate to the research questions of the respective studies. Only two studies included the coding of study quality since it has a direct use in addressing their research questions (Doc_50, Doc_51).

Apart from assessing study quality, coding schemes are frequently used in systematic reviews to capture the variables under study and thus address the research question(s). Nearly half of the studies that report a coding scheme (14 out of 35) use it to assess their variables under study. Here, the reference to the research question(s) is rather direct. Finally, nine studies were identified that use the coding scheme to extract other content-related aspects from their data and in three studies, the coding scheme was part of a lexicometric analysis.

Regarding the coding procedure, it is striking that the studies in our corpus show little transparency in their methodical reports. Only four studies report a reliability value for the coding scheme. Considering that, e. g. in qualitative content analysis, reliability scores have become a major quality indicator, it seems odd that this quality standard is not adapted in systematic reviews. After all, 11 studies report on how disagreements in the coding process were resolved providing at least some clarity and transparency on the coding process. The qualification of the coders described as “the expertise and training provided to individuals charged with coding studies” by Talbott et al (2018, p. 4) is only

mentioned in two studies. This might be due to the fact that the authors usually conduct the coding themselves meaning that their expertise has built up throughout the searching and coding framework development process already and no special training was conducted.

Overall, it becomes obvious that reporting a coding scheme that directly serves to address the research question(s) is rather a rarity than a standard in our study corpus. While most of the studies use a coding scheme to assess the methodical quality and/or to extract information about their variables under study, a significant share of studies mentions or reports coding schemes not directly addressed to the research question(s). Furthermore, the quality and reliability of the coding procedures can hardly be assessed since essential methodical descriptions are missing or are only vaguely described.

4.6 Data Analysis Plan

While after all 35 out 54 studies reported a coding scheme, only nine studies provide a data analysis plan, i. e. any kind of statistical or other methodical procedure to further analyze the (coded) data. Out of these nine studies, only two conduct a comprehensive, methodically well-founded and transparently documented meta-analytical evaluation of the data from their study corpus thus interpreting their research findings "within the context of the methodical rigor of the systematic review" (Talbott et al. 2018, p. 5).

Though not as complex and rigorous, another study calculates effect sizes across its identified studies and controls for publication bias by means of a funnel plot and one study at least provides a descriptive comparison of effect sizes but without taking the methodical quality into consideration. Two further studies use weighting procedures for their data analysis while factoring in methodical aspects of the identified studies.

In contrast to this, three studies analyze their data by means of qualitative-synthesizing methods. In two cases, the qualitative synthesis is realized based on the Joanna Briggs approach of meta-aggregation which is a standardized framework for analyzing qualitative data in systematic reviews (cf. Lockwood et al. 2015). In one case, the data analysis plan is only referred to as a narrative review method which is not defined any further.

All in all, it needs to be noted that even though the nine studies described here attempt to generate preferably evident findings based on their review data, there are still 45 studies in our corpus that report no data analysis plan at all putting it into question which kinds of results they (aim to) produce by means of SR.

4.7 Consolidating Discussion

While the previous chapters have described and discussed findings alongside the coding scheme for this study, i. e. based on the overall process steps of SRs, the following chapter now focuses on identifying and discussing overarching findings on the case of SRs in adult education research. By looking at our study corpus as a whole against the guiding question of how SRs are adapted in adult education research, five groups of studies can be identified based on their coding results regarding the quality indicators.

Group A is made up of studies that provide rarely any or even no description of the method at all (n = 6). SR is simply mentioned in the abstract, title or full text but the full text provides hardly any information on how the review was conducted.

Group B consists of studies that do not meet baseline quality criteria since basic methodical standards of data searching and screening are not comprehensively reported (n = 14). However, while only some of the basic indicators are reported, the studies in this group sporadically refer to more advanced aspects of SRs, e. g. elaborated search procedures by manual searching or by contacting potential authors.

Group C comprises studies that meet baseline methodical requirements of literature reviews in general, especially with regard to a systematic and transparent search procedure (n = 15). However, the methodical outline of the reviews in this group hardly goes beyond these baseline requirements.

Group D is made up of studies that fulfill the baseline requirements and simultaneously report some more sophisticated methodical aspects of SRs (n = 16). These more advanced aspects are in most cases displayed through the description of a coding scheme and reports on the coding procedure making the analysis both more systematic and transparent. Furthermore, the studies in this group usually provide more comprehensive search procedures and a detailed documentation of the screening process.

Finally, Group E presents studies that come closest to the ideal method description of SRs as operationalized in this paper. They are highly reliable as the findings can be replicated based on detailed methodical descriptions regarding both the searching, the screening and the analysis procedures. Furthermore, the studies in this group approach the standards of SRs in that they soundly work towards generating evident findings. Yet, we only identified 3 studies in our sample that could be assigned to this group.

Against the background of this classification, it can be observed that there are obvious efforts of adapting the method of SRs in adult education research in a coherent and methodically reflected matter and the majority of studies does so successfully by meeting at least baseline requirements. However, the studies identified often end with the data extraction, i. e. the searching and screening of literature, and no further systematic analysis is provided generating *new* insights or even new evidence from the respective pool of existing studies. At this point, it remains unclear to what extent the methodical rigor of the studies analyzed here might also be linked to the project and funding structures in which they are embedded and how the publication format might affect methodical descriptions (e. g. monographic publications allow for more detailed reports than comprised journal articles).

Taking into consideration the specifics of adult education research as a discipline with its just beginning orientation and efforts towards evidence-based research (cf. chapter 2), it is not surprising that SRs in adult education research often refer to a qualitative data basis and hardly to randomized controlled trials. Still, there already are a number of approaches offering methodically systematic and well-founded ways for synthesizing and analyzing qualitative data (see e. g., Booth et al. 2022, pp. 235 ff). Furthermore, depending on the research question addressed in the study, an SR approach

might not be perfectly suitable, but there are numerous other methods in the literature review family offering differentiated opportunities for synthesizing and analyzing existing literature corpora (e. g. narrative/integrative/scoping review; for the adult education research field, see e. g. Herbrechter et al. 2018, Mulliez 2021).

5 Conclusion and Outlook

The present study examined the question of how SRs are adapted in adult education research by means of an IR. Overall, 57 studies were identified as relevant and a coding scheme was used to assess how the method of SR was applied. The findings suggest that a majority of the studies fulfill baseline requirements for literature reviews but the specific approach of an SR is rarely applied since the demands for reliability, transparency and methodically controlled data synthesis are hardly met.

These findings open up several implications for further research and methodical debate within the discipline of adult education. Most importantly, future research might take a closer look at single findings from this study. For instance, there is a need for further exploring the application of SRs in adult education regarding the fit between the method of SR and the research question as our findings suggest a frequently occurring mismatch between methodical steps of the SR and the stated research question. Furthermore, the development of the methodical application of SRs over time might be analyzed by taking a longitudinal look at the broader literature corpus of SRs in (adult) education. Finally, the catalogue of quality indicators presented in this study might be further developed and adapted contributing to a debate on and establishment of methodical standards for SRs in the discipline of (adult) education research.

For adult education researchers planning a literature-based review to address a clearly stated research question, this paper demonstrates the relevance of a fit test between research question, data material, and review method. In many cases, an SR is not the best choice in the context of adult education research. Instead, other methods from the literature review family might be more appropriate.

References

Altman, D. & Burton, M. (1999). The Cochrane Collaboration. *Langenbeck's Arch Surgery, 384*, 432–436. https://doi.org/10.1007/s004230050226.

Alves, C. (2018). Research methodology: how to maximize your research potential. *EFORT Open Reviews 3*(5), 184–191. https://doi.org/10.1302/2058-5241.3.170065.

Antes, G. & Oxman, A. D. (2001). The Cochrane Collaboration in the 20th Century. In E. Egger, G. D. Smith & D. G. Altman (Eds.), *Systematic Reviews in Health Care* (pp. 459–473). London: BMJ Books (Medical research). https://doi.org/10.1002/9780470693926.ch25.

Bastian, H., Glasziou, P. & Chalmers, I. (2010). Seventy-Five Trials and Eleven Systematic Reviews a Day. How Will We Ever Keep Up? *PLoS Medicine 7*(9), 1–6. https://doi.org/10.1371/journal.pmed.1000326.

Baumert, J., Artelt, C., Klieme, E., Neubrand, M., Prenzel, M., Schiefele, U., Schneider, W., Tillmann, K.-J. & Weiß, M. (Eds.). *PISA 2000 – Die Länder der Bundesrepublik Deutschland im Vergleich*. Opladen: Leske + Budrich.

Bellmann, J. (2017). Datengetrieben und/oder evidenzbasiert?. In. J. Baumert & K-J. Tillmann (Eds.) E*mpirische Bildungsforschung. Zeitschrift für Erziehungswissenschaft Sonderhef, 31* (pp. 147–161). Springer VS, Wiesbaden. https://doi.org/10.1007/978-3-658-13785-4_9.

Blümle, A., Meerphol, J. J., Wolff, R. & Antes, G. (2009). *Evidenzbasierte Medizin und systematische Übersichtsarbeiten*. MKG-Chirurg *2*(2), 86–92. https://doi.org/10.1007/s12285-009-0081-6.

BMBF (2013). *Systematische Reviews mit hoher Relevanz für die Patientenversorgung*. URL: https://www.gesundheitsforschung-bmbf.de/de/systematische-reviews-mit-hoher-relevanz-fur-die-patientenversorgung-9042.php (accessed on 15.11.2022).

Boeren, E. (2018). The Methodological Underdog: A Review of Quantitative Research in the Key Adult Education Journals. *Adult Education Quarterly, 68*(1), 63–79. https://doi.org/10.1177/0741713617739347.

Booth, A., Sutton, A., Clowes, M. & Martyn-St James, M. (2022). *Systematic Approaches to a Successful Literature Review*. Third Edition. New York: SAGE Publishing.

Burns, T. & Schuller, T. (2007). The Evidence Agenda. In OECD (Ed.), *Evidence in education. Linking research and policy. OECD; Evidence-based policy research in education* (pp. 15–32). Paris: OECD (Knowledge management). https://doi.org/10.1787/9789264033672-2-en.

Cenka, B., Santoso, H., & Junus, K. (2022). *Personal learning environment toward lifelong learning: An ontology-driven conceptual model*. Interactive Learning Environments. https://doi.org/10.1080/10494820.2022.2039947.

Chandler, J., Cumpston. M., Thomas, J., Higgins, J. P. T., Deeks, J. J. & Clarke, M. J. (2022). Chapter I: Introduction. In. J. P. T. Higgins, J. Thomas, J. Chandler, M. Cumpston, T. Li, M. J. Page & V. A. Welch (Eds.). *Cochrane Handbook for Systematic Reviews of Interventions version 6.3* . https://training.cochrane.org/handbook.

Garritty, C., Gartlehner, G., Nussbaumer-Streit, B., King, V. J., Hamel, C., Kamel, C., Affengruber, L., & Stevens, A. (2021). Cochrane Rapid Reviews Methods Group offers evidence-informed guidance to conduct rapid reviews. *Journal of clinical epidemiology, 130*, 13–22. https://doi.org/10.1016/j.jclinepi.2020.10.007.

Hammersley, M. (2020). Reflections on the Methodological Approach of Systematic Reviews. In: O. Zawacki-Richter, M. Kerres, S. Bedenlier, M. Bond & K. Buntins (Eds.), *Systematic Reviews in Educational Research* (pp. 23–39). Wiesbaden: Springer VS. https://doi.org/10.1007/978-3-658-27602-7_1.

Handzic, M., Edwards, J. S., Moffett, S., Garcia-Perez, A., Kianto, A. & Bolisani, E. (2017), Five Ws and one H in knowledge management education. *VINE Journal of Information and Knowledge Management Systems 47*(4), S. 438–453. https://doi.org/10.1016/j.procs.2016.09.112.

Hannes, K., Raes, E., Vangenechten, K., Heyvaert, M., & Dochy, F. (2013). Experiences from employees with team learning in a vocational learning or work setting: A systematic review of qualitative evidence. *Educational Research Review*, 10, 116–132. https://doi.org/10.1016/j.edurev.2013.10.002.

Herbrechter, D., Hahnrath, E. & Kuhn, X. (2018). Professionelle Lerngemeinschaften als Konzept zur berufsbegleitenden Professionalitätsentwicklung der Lehrenden in der Erwachsenen- und Weiterbildung? Ein narratives Review. *Internationales Jahrbuch der Erwachsenenbildung 41*, 85–105. https://doi.org/10.3278/6004672w085.

Higgins, J. P., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M. J. & Welch, V. A. (Eds.) (2019). *Cochrane Handbook form Systematic Reviews of Interventions*. Second Edition. Hoboken: Wiley Blackwell. https://doi.org/10.1002/9781119536604.

Ioannidou, A. & Parma, A. (2022). Risk of Job Automation and Participation in Adult Education and Training: Do Welfare Regimes Matter? *Adult Education Quarterly 72*(1), 84–109. https://doi.org/10.1177/07417136211026635.

Koller, J. (2021). Dimensionen und Perspektiven von Innovationen in der Erwachsenenbildung – ein systematic literature review. *Internationales Jahrbuch der Erwachsenenbildung 44*, 133–155. https://doi.org/10.3278/6004675W008.

Landis, J. R., & Koch, G. G. (1977). The Measurement of Observer Agreement for Categorical Data. *Biometrics, 33*(1), 159–174. https://doi.org/10.2307/2529310.

Lockwood, C., Munn, Z., & Porritt, K. (2015). Qualitative research synthesis: methodological guidance for systematic reviewers utilizing meta-aggregation. *International Journal of Evidence-Based Healthcare*, 13 (3), 179–187. https://doi.org/10.1097/XEB.0000000000000062.

Mulliez, G. (2021). Forschung zu Weiterbildung und Migration? Eine Bestandsaufnahme mittels eines Scoping-Reviews. *Internationales Jahrbuch der Erwachsenenbildung* 44. 163–189. https://doi.org/10.3278/6004675W.

Newman, M. & Gough, D. (2020). Systematic Reviews in Educational Research: Methodology, Perspectives and Application. In O. Zawacki-Richter, M. Kerres, S. Bedenlier, M. Bond & K. Buntins (Eds.), *Systematic Reviews in Educational Research* (pp. 3–22). Wiesbaden: Springer VS. https://doi.org/10.1007/978-3-658-27602-7_1.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron I., Hoffmann T. C., Mulrow C. D. et al. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021; 372 :n71. https://doi.org/10.1136/bmj.n71.

Papaioannou, D., Sutton, A., Carroll, C., Booth, A., & Wong, R. (2010). Literature searching for social science systematic reviews: consideration of a range of search techniques. *Health Information & Libraries Journal, 27*(2), 114–122. https://doi.org/10.1111/j.1471-1842.2009.00863.x.

Rasmussen N. L. & Montgomery, P. (2018). The prevalence of and factors associated with inclusion of non-English language studies in Campbell systematic reviews: a survey and meta-epidemiological study. *Systematic Review, 129(*7), 1–12. https://doi.org/10.1186/s13643-018-0786-6.

Rubenson, K. & Elfert, M. (2015). Adult education research: exploring an increasingly fragmented map. *European Journal for Research on the Education and Learning of Adults, 6*(2), 125–138. https://doi.org/10.3384/rela.2000-7426.rela9066

Sackett, D. L., Rosenberg, W. M., Gray, J. A., Haynes, R. B., & Richardson, W. S. (1996). Evidence based medicine: what it is and what it isn't. *BMJ (Clinical research ed.)*, *312*(7023), 71–72. https://doi.org/10.1136/bmj.312.7023.71.

Sahlender, M. & Schrader, J. (2017). Spracherwerb bei Zugewanderten und funktionalen Analphabeten. *Zeitschrift für Weiterbildungsforschung 40*(3), 275–293. https://doi.org/10.1007/s40955-017-0098-9.

Schrader, J. & Berzbach, F. (2005): *Empirische Lernforschung in der Erwachsenenbildung/ Weiterbildung*. Bonn: texte.online. http://www.die-bonn.de/esprid/dokumente/doc-2005/schrader05_01.pdf.

Schrader, J. (2014). Analyse und Förderung effektiver Lehr-Lernprozesse unter dem Anspruch evidenzbasierter Bildungsreform. *Zeitschrift für Erziehungswissenschaft 17*, 193–223. https://doi.org/10.1007/s11618-014-0540-3.

Smith, R. & Keiner, E. (2015). Erziehung und Wissenschaft, Erklären und Verstehen. *Zeitschrift für Pädagogik 61*(5), 666–682. https://doi.org/10.25656/01:15420.

Song, F., Parekh, S., Hooper, L., Loke, Y. K., Ryder, J., Sutton, A. J., Hing, C., Kwok, C. S., Pang, C., & Harvey, I. (2010). Dissemination and publication of research findings: an updated review of related biases. *Health technology assessment,14*(8), iii-193. https://doi.org/10.3310/hta14080.

Spitzer, L. & Grafe, M. (2014). Forschungsergebnisse, Patientenpräferenz und Therapeutenerfahrung integrieren – Ein Plädoyer für ein differenziertes Bild von evidenzbasierter Praxis in den Therapieberufen. *Zeitschrift für Physiotherapeuten 66*(1), 26–30.

Stodolka, F. & Goeze, A. (2019). Das Personal als Ressource der Erwachsenenbildung/ Weiterbildung: Ein systematisches Review über das Zusammenwirken unterschiedlicher Personalgruppe. *Hessische Blätter für Volksbildung 69*(4), 354–364. https://doi.org/10.3278/HBV1904W354.

Talbott, E., Maggin, D. E., Van Acker, E. Y. & Kumm, S. (2018). Quality Indicators for Reviews of Research in Special Education. *Exceptionality, 26*(4), 245–265. https://doi.org/10.1080/09362835.2017.1283625.

Taylor, E. W., Beck, J. & Ainsworth, E. (2001). Publishing qualitative adult education research: A peer review perspective. *Studies in the Education of Adults, 33*(2), 163–179. https://doi.org/10.1080/02660830.2001.11661452.

Thomas, J., Kneale, D., McKenzie, J. E., Brennan, S. E. & Bhaumik, S. (2019). Determining the scope of review and the question it will address. In J. P. T. Higgins & James Thomas (Eds.), *Cochrane Handbook for Systematic Reviews of Interventions* (pp. 13–31). Hoboken: Wiley Blackwell. https://doi.org/10.1002/9781119536604.ch2.

Toepper, M., Zlatkin-Troitschanskaia, O., & Kuhling-Thees, C. (2022). Literature review of international empirical research on transfer of vocational education and training. International Journal of Training and Development, 1–23. https://doi.org/10.1111/ijtd.12276.

Toronto C. E. & Remington R. A. (2020). Step-by-Step Guide ton Conducting an Integrative Review. New York: Springer. https://doi.org/10.1007/978-3-030-37504-1.

Vetter, T. (2022). Who Publishes What? – A Bibliometric Study of Papers from the Global South in International Journals of Adult Education Research. *Internationales Jahrbuch der Erwachsenenbildung, 45,* 107–128. https://doi.org/103278/I72685W007.

Zawacki-Richter, O., Kerres, M., Bedenlier, S., Bond, M. & Buntins, K. (Eds.) (2020). *Systematic Reviews in Educational Research*. Wiesbaden: Springer VS. https://doi.org/10.1007/978-3-658-27602-7.

Authors

Tim Vetter, M. A., is a research associate at the Chair of Adult Education/Continuing Education at the University of Cologne. In the context of his dissertation, he deals with questions of openness, transparency and representation of the international publication system of adult education research. His research interests include bibliometrics of adult education research, adult educational organization research, and workplace learning.

Contact
University of Cologne
Faculty of Human Sciences
Department of Educational and Social Science
Professorship for Adult and Continuing Education
Innere Kanalstraße 15
50823 Cologne
Germany
t.vetter@uni-koeln.de

https://orcid.org/0000-0003-1139-8328

Gwennaëlle Mulliez, M. A., is a research associate and doctoral candidate at the Chair of Adult Education/Continuing Education at the University of Cologne. Her research interests include migration-society and organization-related continuing education research.

Contact
University of Cologne
Faculty of Human Sciences
Department of Educational and Social Science

Professorship for Adult and Continuing Education
Innere Kanalstraße 15
50823 Cologne
Germany
mulliez.gwennaelle@uni-koeln.de

https://orcid.org/0000-0001-7601-1820

Eva Bonn, M. A., is a research associate and doctoral candidate at the Chair of Adult Education/Continuing Education at the University of Cologne. Her research interests include coordination of action in adult education, competencies of adult education teaching staff and organization-related research in adult education.

Contact
University of Cologne
Faculty of Human Sciences
Department of Educational and Social Science
Professorship for Adult and Continuing Education
Innere Kanalstraße 15
50823 Cologne
Germany
eva.bonn@uni-koeln.de

https://orcid.org/0000-0001-7342-1672