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CHALLENGES IN THE LITERATURE SEARCH DURING THE PROCESS OF CONDUCTING A SYSTEMATIC LITERATURE REVIEW FOR THE CONCEPTUALISATION OF CRITICAL THINKING

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Abstract

This article discusses challenges in the literature search during the process of conducting a systematic literature review for the conceptualisation of critical thinking. The literature search process is described in two interconnected stages: the selection of journals and the sampling of articles. Analysis is followed by discussion, which also includes the subjective reasoning and reflections of the project team. The process of searching the relevant literature for a systematic literature review was presented in order to discuss the initial stage before literature analysis that very often remains a "grey area" and is still underrepresented in the literature. The process of selecting journals and sampling articles was impacted by objective limitations such as language and availability of access of material, as well as by subjective limitations which required flexibility in adjusting the envisaged research plan. These factors led to the unique path by which the research team processed the search and coped with methodological challenges. Some lessons, like the necessity of additional time, were already known and experienced during earlier research; however, they showed themselves in other aspects. Some lessons, such as not limiting the literature review to articles from Q1 journals, were new and unexpected, and led to the decision to discuss these challenges, thus enriching a very limited analysis on methodological issues of the literature search process for the term conceptualisation. *This article focuses on how material on critical thinking for the literature review was sought, rather than the content that was found. This experience is intended to broaden the understanding of the initial phase in a systematic literature review process and to help increase awareness of what preparation for a literature review actually means.*

Keywords: *literature search, systematic literature review, conceptualisation, critical thinking, higher education*

Introduction

Social research methodology emphasises that literature review is a crucial step in the research process. It allows researchers to accumulate past experience (Gomersall, 2007) and summarise earlier knowledge in the field; introduces methodological and design issues; provides data sources and opportunities to compare one's own research with previous work (Leedy, 1997); provides a rationale for further study (Badke, 2017); and leads to new insights when the literature is reviewed and each piece of relevant information is seen in the context of other information (Aveyard, 2014). At the same time, there is increasing recognition that literature review is a complicated, sometimes confusing, and laborious process (Chen, Wang & Lee, 2016), while methods of undertaking review are rigorous and time-consuming (Aveyard, 2014).

As a literature review is essential in any research or project work, this one was planned as an integral part of our four-year research "Critical Thinking in Higher Education: A Study and Labour Market Perspective". Initially, a systematic literature review approach (Cronin, Frances & Coughlan, 2008) was chosen for the conceptualisation of critical thinking. Critical thinking is a vibrant topic and one of the most discussed competences. Furthermore, it is accorded an important role in contemporary society, in the globalising labour market and in the creation of the welfare of the individual and the community. However, there is no agreement as to what critical thinking is or how it expresses itself in practical situations and spheres of social life (Bailin, 2002;

Halpern, 1998; Lewis & Smith, 1993; Facione, 1990; Willingham, 2007). As Kubok (2018) states, what critical thinking is seems to be self-evident, but when it comes to defining what critical thinking actually is, challenges arise. There is a lack of articles describing methodological aspects of the conceptualisation of the notion of critical thinking, which would be based on a systematic literature review. Among the few existing articles, only two could be mentioned as presenting the conceptualisation of critical thinking: Billing (2007), who described the methodology of a survey of over 700 articles; and Bekele (2009), who revised articles about critical thinking and problem-solving published during the 1995–2006 period. Therefore, the research team aimed to perform a systematic literature review for the conceptualisation of critical thinking, especially in the field of education. Despite the abundance of literature about critical thinking in education, most is restricted to: testing existing theories; the analysis of cognitive skills, characteristics or attitudes; and investigations of specific study programme curricula or students' cognitive skills (Lai, 2011). A pilot investigation (Penkauskienė, 2017) showed that critical thinking in higher education is investigated inconsistently and fragmentarily, is limited mostly to general theoretical reasoning (Moore, 2013; Shephard et al., 2015; Cake et al., 2016; Heijltjes et al., 2015), and lacks detailed methodological description. Meanwhile, empirical articles are fragmented (Liu et al., 2016) and do not provide a full picture (Phan, 2008; Slabon et al., 2014). Researchers (Ku, 2009; Norris & Ennis, 1989; Silva, 2008) recognise the limitations of such studies and call for the combination of various methods, the search for new instruments, and the investigation of critical thinking in specific contexts.

The importance of the literature review, the obscurity of the definition of critical thinking, and the lack of analysis regarding the methodological challenges of a literature review connected with a specific topic – in this case, the conceptualisation of critical thinking – all provide evidence for the relevance of this article. They also raise research questions regarding challenges in the literature search during a systematic literature review and subjective and objective limitations to this process. The findings of the content of the literature review are presented in another article; the focus of this article is on the literature search process and the main challenges, both projected and unanticipated, which were faced by the research team.

1. Research methodology

1.2. Method

A systematic literature review was undertaken as a planned stage of the project. For the purpose of this paper, the research team describes the literature search process in two interconnected steps: the selection of journals and the sampling of articles. Analysis is followed by discussion, which also includes subjective reasoning and the reflections of the project team.

1.2. Background of the Literature Search

For the conceptualisation of critical thinking, a systematic literature review approach was chosen from the fourteen literature review types suggested by Grant and Booth (2009). Systematic review differs from a traditional or narrative review as it uses a more rigorous and well-defined approach to reviewing the literature in a specific subject area. Unlike a traditional review, the

purpose of a systematic review is to provide a list of all published articles relating to a particular subject area that is as complete as possible. While a traditional review attempts to summarise the results of a number of studies, a systematic review uses explicit and rigorous criteria to identify, critically evaluate and synthesise literature on a particular topic (Cronin, 2008). Parahoo (2006) suggests that a systematic literature review details the time frame within which the literature was selected, as well as the methods used to evaluate and synthesise the findings of the studies in question. In order for the reader to assess the reliability and validity of the review, the reviewer needs to present the precise criteria used to: formulate the research question; set inclusion or exclusion criteria; select and access the literature; assess the quality of the literature included in the review; and analyse, synthesise and disseminate the findings. This process is described in the article.

The strategy of the literature search was focused on the Clarivate Analytics database. The sampling design was created from top to bottom, i.e., the search for conceptualisations of critical thinking started with journals which fall into the first quartile by reference indexes. Two out of Barret's (in Edyburn, 2001) seven distinguished strategies for literature search were applied. The first of these – *a general search* – was done not due to a small amount of knowledge about the topic on the part of the authors, as the Barret suggests is the case, but due to the desire to capture every source containing the concept of critical thinking. However, this intention was hindered by two factors: first, the impossibility of attaining every selected document due to restricted access to some articles; and second, the prevalence of extraneous, incoherent and irrelevant material. Therefore, *a specific search* using Boolean logic (i.e., "AND") was applied as a means of linking key concepts ("critical thinking" AND "higher education") and, accordingly, reducing irrelevant items.

In the initial phase, there were no defined expectations regarding how much material would be found. The research team went into the field without prescribed attitudes towards potential results and was ready to analyse any amount of material. However, it was not expected that results would be so scarce and that the material found would be insufficient to achieve the goal of conceptualising critical thinking. Therefore, the research team applied an adaptive literature search model. This entire process can be divided into two major stages – the selection of journals and the sampling of articles – that are presented further.

1.3. The Selection of Journals

As the interest was in the concept of critical thinking in higher education, the first task was to identify journals of interest in the field of higher education. It was assumed that top-quality papers on critical thinking in the field of education are in journals included in the Clarivate Analytics Web of Science database. The research team referred to this database as a tool useful for the identification of the most-cited articles published in journals indexed in the Web of Science Core Collection database.

In the first step, higher education journals included in the selected database were searched for. The keywords *education* and *educational* were applied. The list of journals for analysis was generated using the Clarivate Analytics Journal Citation Reports database, evaluating the journal

impact factor for the year 2016.[1] Journals under specified keywords were divided into four themes:

(1) Education and educational research;
(2) Education, scientific disciplines;
(3) Education, special;
(4) Psychology, educational.

A separate list of journals was generated for each theme, and journal impact factor was employed as a general criterion of the quality of a journal; in particular, quartiles by journal impact factor.

In the second step, journals were grouped by quartiles. A quartile is a statistical indicator that shows the position of the journal in the subject category based on the distribution of the citation index between the maximum and minimum values. Quartiles are indicated by the letter Q, and divide the sequence of attributes into four equal parts. The number from 1 to 4 next to the letter indicates the position of the quartile. Thereby, Q1 is the quartile containing the first 25 per cent of all journals ranging from the highest to the lowest journal impact factor. Accordingly, Q2 and Q3 are quartiles in the middle by decreasing impact factor, and Q4 includes the last 25 per cent of all journals – the least-cited, compared to the rest (Trumpienė & Šegždienė, 2012).

In the third step, the verification of each journal was carried out. This action was performed in accordance with the recommendations of the university's assistant librarian in order to avoid predatory journals. Since there were journals with identical titles, each journal was crosschecked on the EBSCOhost platform by typing the title of the journal and verifying its ISSN back and forth. After the identification of a particular journal as matching the main criteria in terms of impact factor, authenticity, and accession possibilities, the journal was included in the list of journals in which articles about critical thinking were searched for. The final distribution of the journals is presented in Table 1.

Table 1. Number of journals in quartiles by theme

Themes	Total	Q1	Q2	Q3	Q4
Education & educational research	235	58	59	56	58
Education, scientific disciplines	41	10	10	10	11
Education, special	38	9	10	9	10
Psychology, educational	58	14	15	2	1
Total	372	91	94	77	80

A similar number of journals belonged to Q1 and Q2 (91 and 94 respectively), while Q3 included 77 journals and Q4 80. In total, 372 journals were examined further. The largest share in all quartiles was occupied by the theme Education & educational research (235 journals).

[1] Journal impact factors are estimated after a certain period of time; therefore, the impact factors obtained in March 2018 cover the years up to 2016, and were actual only to June 2018.

2. The Results of the Sampling of Articles

A two-step sampling process of articles containing coherent information on critical thinking was conducted.

In the first step, the articles were searched for using the online research platform EBSCOhost (https://www.ebsco.com/). The date of publication covered a 20-year period (1997–2017).[2] Sampling of the articles within selected journals was carried out using a search setting consisting of the following selection criteria:

- ISSN of the particular journal;
- Keyword critical thinking in the field of subject terms;
- Full text;
- Period of 1997–2017;
- English language.

This setting produced 615 articles published in Q1 journals, 397 articles in Q2, 911 in Q3, and 1,298 in Q4. In total, there were 3,221 articles to be analysed. For the team of eight researchers, this meant 403 articles to review and analyse per researcher. However, a preliminary review of the articles showed that many articles were far from the subject matter under analysis – specifically, critical thinking in higher education. The team had to come up with a way to optimise the process of the selection of articles.

Therefore, in the second step, more detailed inclusion criteria were applied. It was decided to refine the search parameters. The search setting was added to with another keyword – *higher education* in the subject terms field. This helped to narrow the search field and allowed us to focus on the concept of critical thinking in the context of higher education. Keeping other parameters, the same, but with the keywords *critical thinking* AND *higher education,* the total number of articles was 55 in Q1, 264 in Q2, 245 in Q3, and 240 in Q4 (see Table 2).

Table 2. Number of articles in quartiles by primary and refined search parameters

Themes	Q1		Q2		Q3		Q4	
	CT*	CT and HE**	CT	CT and HE	CT	CT and HE	CT	CT and HE
Education & educational research	218	31	390	264	708	227	1,226	229
Education, scientific disciplines	347	18	0	0	122	10	63	9
Education, special	1	0	3	0	47	4	8	1
Psychology, educational	49	6	4	0	34	4	1	1
Total	615	55	397	264	911	245	1,298	240

*CT – critical thinking

**CT and HE – critical thinking AND higher education

[2] Due to data on journal impact factors covering the period until the end of 2016 at the moment of this research, it is possible that not all publications from 2017 were presented in their correct quartiles in cases where a journal was moved to another quartile after the beginning of a new period of impact factor calculation.

In the final stage, the number of articles which were selected for analysis was reduced due to limited access to article content. Articles with an access fee were classified as articles with limited access, and were therefore removed from the planned list of articles to be analysed. After the last adjustment, 303 articles remained for in-depth content analysis. These articles constituted the final array of material related to the concept of critical thinking in higher education. The research team worked further by conducting a systematic literature review of selected papers, the results of which are beyond the scope of this article.

3. Discussion and Conclusions

Reflection on the literature search as a step in the process of a systematic literature review for the conceptualisation of critical thinking allows the methodological challenges faced by the research team to be discussed.

The first challenge was at the journal selection stage. The journal accession policy diminished the number of selected journals as some of them were closed or inaccessible from the university account. These circumstances were beyond the power of research team, and thereby may be named as limitations arising from structural conditions related to the university's subscription policy.

The next challenges were connected with the sampling of the articles. The research team did not have *a priori* assumptions of the potential analytical work to be done in order to implement one of the tasks of the project – to conceptualise critical thinking. However, there were unwritten expectations that Q1 journals would produce the desired result, and the team could thus proceed along the project plan. However, the results were disappointing. Q1 journals did not provide enough material based on what the research team would need to be able to carry out a systematic analysis of the concept of critical thinking. Therefore, in a regular review meeting the decision was made to analyse articles in journals of other quartiles.

Since this work was carried out not by an individual but by a research group, it required within the group the skills of collaborative problem-solving, distribution of responsibilities, solidarity, emerging leadership and process monitoring.

The process of a systematic literature review on critical thinking was much longer and more challenging than the research team planned. Flexibility was needed in redesigning the literature search; however, this decision led to a new challenge – to produce project results on time. Every researcher experienced the fact that a systematic literature review requires considerable effort, time and energy, starting from an idea and finishing with a research report or publication. Between these two points, there are many hours of collaboration, problem solving, creativity, critical thinking, discussing, reading, monitoring, writing, deleting and re-writing. Most researchers in their papers analyse and present the main findings, insights and other results of their research projects, and do not describe the methodology in detail. Therefore, readers only see the final product – the tip of the iceberg of the whole background work of the research team.

The research team found the lack of methodological literature (not textbooks) for the conceptualisation of critical thinking challenging. The literature search process presented in this article revealed that published theoretical articles emphasise analytical conceptualisation and reasoning, and pay less attention to how any particular conceptualisation was performed. Among the 303 revised articles from the 1997–2017 period, few describe how the researcher

conceptualised one or another definition, as most authors provide a literature overview and leave the reader to decide on the validity of analysis. As was said earlier, very rarely is the methodology described in depth. Among the few articles that do so, only two – Billing (2007) and Bekele (2009) – could be mentioned as describing the methodology of reviewing articles in a more detailed way. This article benefits methodology and knowledge-building in the field of critical thinking in the 1997–2017 period.

Despite knowing very well what a systematic literature review is, how it is done, what challenges could arise and the ways of overcoming them, the research team went through a hazardous process in conceptualising critical thinking. Some lessons, such as the necessity of additional time, had already been learnt and experienced during earlier research; however, they showed themselves in other aspects. Some lessons, such as not limiting a literature review to articles from Q1 journals, were new and unexpected, and led to the decision to discuss these challenges. This novelty thus enriches a very limited analysis on the methodological issues of the process of searching for literature on the term conceptualisation.

This article focuses on how material for a literature review on critical thinking was searched for, rather than what content was found. The process of searching for the relevant literature for a systematic literature review was presented in order to discuss the initial stage before literature analysis, which very often remains a "grey area" and is still underrepresented in the literature. The process of selecting journals and sampling articles was impacted by objective (or structural) limitations such as language and availability of access to material due to its subscription and fee policy. At the same time, the research team faced subjective limitations such as unsatisfied expectations in terms of the requested amount of literature, which required flexibility in adjusting the envisaged research plan and had an impact on the entire time schedule. These factors led to the unique way in which the research team processed this search and coped with methodological challenges. It is crucial to realize that high-ranking publications do not necessary include a sufficient amount of theoretical material on the subject that is intend for analysis. We tried to present the path that the research team took to overcome the barriers that arose in the process of gathering and analysing appropriate scientific literature. This experience can broaden the understanding of the initial phase in the systematic literature review process, and can help to increase awareness of what preparation for a literature review actually means.

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Summary

Social research methodology emphasises that the literature review is a crucial step in the research process. It allows researchers to accumulate past experience and summarise earlier knowledge in the field; introduces methodological and design issues; provides data sources and opportunities to compare one's own research with previous work; provides a rationale for further study; and leads to new insights when the literature is reviewed and each piece of relevant information is seen in the context of other information. At the same time, there is increasing recognition that the literature review process is complicated, sometimes confusing, and laborious, while methods of undertaking review are rigorous and time-consuming. The systematic literature review approach according Cronin, Frances and Coughlan (2008) was chosen for the conceptualisation of critical thinking. Despite the abundance of literature about critical thinking in education, most is restricted to testing existing theories, the analysis of cognitive skills, characteristics or attitudes, and investigations of specific study programme curricula or students' cognitive skills. Critical thinking in higher education has been investigated inconsistently and fragmentally, has been limited mostly to general theoretical reasoning, and has lacked detailed methodological description. Meanwhile, empirical articles are fragmented and do not provide a full picture. Researchers recognise the limitations of such studies and call for a combination of various methods, a search for new instruments, and the investigation of critical thinking in specific contexts. The importance of the literature review, the obscurity of the definition of critical thinking, and the lack of analysis of the methodological challenges in conducting a literature review connected with a specific topic – in this case the conceptualisation of critical thinking – all provide evidence for the relevance of this article. They also raise research questions regarding challenges in the literature search during a systematic literature review, and the subjective and objective limitations in this process. The findings of the content of

the literature review are presented in another article; the focus of this article is on the literature search process and the main challenges, both projected and unanticipated, which were faced by the research team. The literature search process is described in two interconnected stages: the selection of journals and the sampling of articles. Analysis is followed by discussion which also includes the subjective reasoning and reflections of the project team. Although the research team was familiar with what a systematic literature review is and how it is conducted, and had experience of the challenges that can arise and how to overcome them, they still experienced difficulties in conceptualising critical thinking. Challenges such as time-intensity were already known, but in this process, they revealed themselves in other ways. One such lesson – not to limiting the literature review to Q1 journals – was new and unexpected. Thus, it was decided to discuss these challenges and to enrich the very limited analysis of the methodological issues of the literature search process in the context of conceptualising a term. This article focuses on how material on critical thinking for a literature review was searched for, rather than what content was found. This experience tends to broaden the understanding of the initial phase in a systematic literature review process, and can help to increase awareness of what preparation for a literature review actually means.

Keywords: *literature search; systematic literature review; conceptualisation; critical thinking; higher education.*

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