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Mapping lifelong learning quality: a bibliometric study

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Abstract. This study employs bibliometric analysis to investigate the landscape of research on lifelong learning quality. Examining 218 publications from 1969 to 2020, we explore trends, topics, and collaborative networks. Our analysis reveals a surge of interest post-2000, covering diverse domains. Through clustering keywords, we identify themes like continuing education and quality assurance. Collaboration patterns among authors, institutions, and countries are also illuminated. This study offers insights into the complex realm of lifelong learning quality, providing a foundation for further research.

Keywords: lifelong learning, quality assurance, bibliometric analysis, continuing education, professional development.

1 Introduction

Lifelong learning is a dynamic process that varies depending on individual skills and motivation for self-regulated, generative learning and on life events that impose challenges that sometimes demand incremental/adaptive change and other times require frame-breaking change and transformational learning [2]. There are many synonyms for lifelong learning [3]. According to [1], “continuing education”, “adult education”, “continuing professional development” are most used terms. Figure 1 shows a line chart with four different colors representing the frequency of each term per year, based on Google’s text corpora. The chart reveals that lifelong learning is the most popular term in 2020s, followed

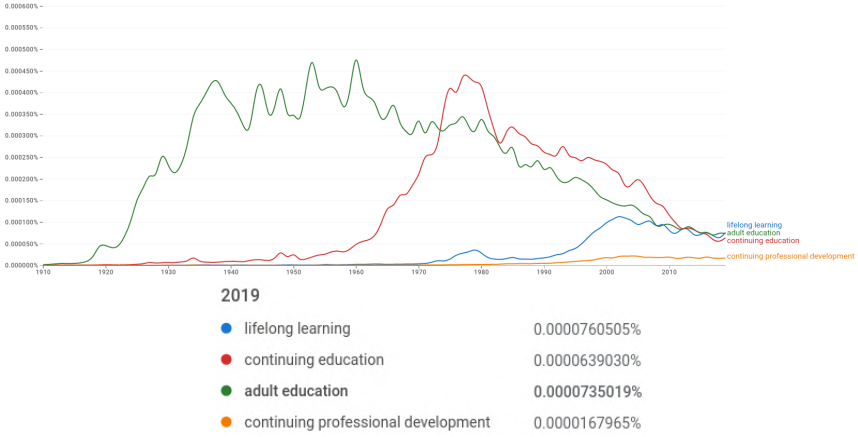

Fig. 1. A comparison of the usage of lifelong learning and its synonyms in English texts from 1910 to 2019.

by continuing education and adult education. The other terms have much lower frequencies and show little variation over time.

However, the quality of lifelong learning is not easy to define, measure, or evaluate, as it depends on various factors, such as the context, the purpose, the content, the methods, and the outcomes of learning. Therefore, it is important to explore how lifelong learning quality is conceptualized, operationalized, and assessed in different disciplines and domains.

This paper aims to provide an overview of the literature on lifelong learning quality, using bibliometric analysis as a methodological tool. Bibliometric analysis is a quantitative approach that uses statistical and mathematical techniques to analyze the patterns, trends, and relationships of publications in a specific field or topic. By applying bibliometric analysis to the publications on lifelong learning quality, this paper intends to answer the following research questions:

RQ1: What are the main characteristics and features of the publications on lifelong learning quality, such as the number, distribution, and citation of publications?

RQ2: What are the main topics of the publications on lifelong learning quality?

RQ3: What are the main sources and networks of the publications on lifelong learning quality, such as the journals, authors, institutions, and countries that publish and collaborate on lifelong learning quality?

The paper is organized as follows: section 2 describes the data collection and analysis methods used in this study; section 3 presents and discusses the results of the bibliometric analysis; section 4 concludes with some implications and suggestions for future research.

2 Methodology

The data for this study were collected from Scopus, which is the largest abstract and citation database of peer-reviewed literature. The search query used to retrieve the relevant publications from Scopus was:

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(TITLE("lifelong learning") OR TITLE("continuing education")
 OR TITLE ("adult education") OR TITLE (
 "continuing professional development")) AND TITLE("quality")
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This query searched for the terms "lifelong learning", "continuing education", "adult education", or "continuing professional development" in the title of the publications, and also required the term "quality" to be present in the title. The query was restricted to the title field to ensure the relevance and specificity of the publications to the topic of lifelong learning quality. The query was also case-insensitive and did not use any wildcards or operators.

The search was conducted on December 1, 2020, and resulted in 218 publications that matched the query criteria. The publication date range of the retrieved publications was from 1969 to 2020, with the majority of them published after 2000. The publication types included articles (151), conference papers (18), editorials (15), reviews (12), book chapters (10), notes (4), letters (4), short survey (3) and book (1).

The metadata of the retrieved publications, such as title, authors, keywords, abstract, year, source, and citations, were exported from Scopus in CSV format. The CSV file was then uploaded to VOSviewer for further analysis.

In this study, VOSviewer was used to create and visualize a co-occurrence network of keywords – a network in which the nodes represent keywords and the links represent the co-occurrence frequency of keywords in the same publication.

The settings used to create the co-occurrence network of keywords in VOSviewer were: type of analysis – co-occurrence; unit of analysis – all keywords (author and index); counting method: full counting; minimum number of occurrences of a keyword – 5.

Using these settings, VOSviewer identified 71 keywords that met the threshold out of 913 keywords in total. For each keyword, VOSviewer calculated the total number of occurrences in the dataset, as well as the total link strength with other keywords. Three common keywords that did not reflect any specific theme or topic ("human", "article", "humans") were manually excluded from the network. The remaining 68 keywords with the highest total link strength were selected for further analysis.

VOSviewer then applied a clustering algorithm to group the keywords into clusters based on their similarity and proximity in the network. The clustering algorithm used a resolution parameter that determined the number and size of clusters. A higher resolution parameter resulted in more and smaller clusters, while a lower resolution parameter resulted in fewer and larger clusters. In this study, the resolution parameter was set to 1.0 by default. Using this parameter, VOSviewer identified four clusters of keywords in the network (figure 2).

3 Findings

3.1 RQ1: What are the main characteristics and features of the publications on lifelong learning quality, such as the number, distribution, and citation of publications?

Figure 3 shows the number and distribution of publications by year from 1969 to 2020. The figure reveals that the publications on lifelong learning quality have increased significantly over time, especially after 2000. The peak years were 2015 and 2018, with 15 publications. The lowest number of publications was in 1969, 1974, and 1984, with only one publication. The average number of publications per year was 4.8.

Figure 4 shows the citation analysis of the publications on lifelong learning quality. The figure indicates that the total number of citations for the 218 publications was 816, with an average of 3.7 citations per publication. The most cited publication was "Safety and quality of nurse independent prescribing: A national study of experiences of education, continuing professional development clinical governance" by Smith et al. [4], published in 2014, with 33 citations. The least cited publications were those that had zero citations, which accounted for 48% of the total

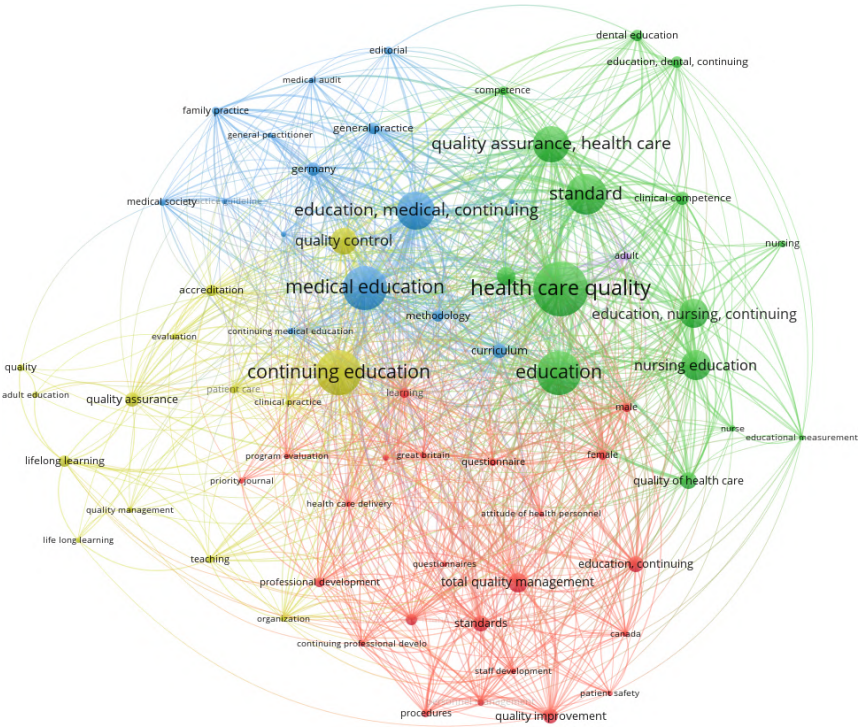

Fig. 2. Keyword co-occurrence network visualisation.

publications. The citation distribution was highly skewed, with a few publications receiving many citations and many publications receiving few or no citations.

3.2 RQ2: What are the main topics of the publications on lifelong learning quality?

First cluster (red) mainly focuses on the quality of *continuing education and professional development* for health personnel, especially in the *United Kingdom and Canada*. The publications in this cluster explore the *standards, procedures, evaluation, and improvement* of continuing education and professional development programs, as well as the *attitudes and perceptions* of health personnel towards them. The publications also examine the impact of continuing education and professional development

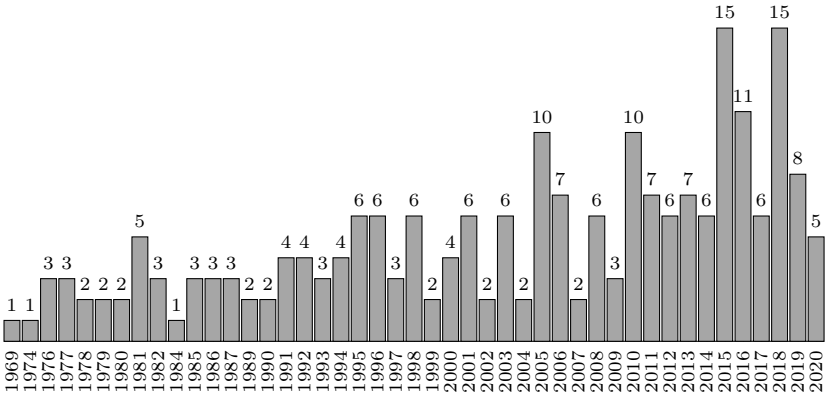

Fig. 3. Number of articles by year.

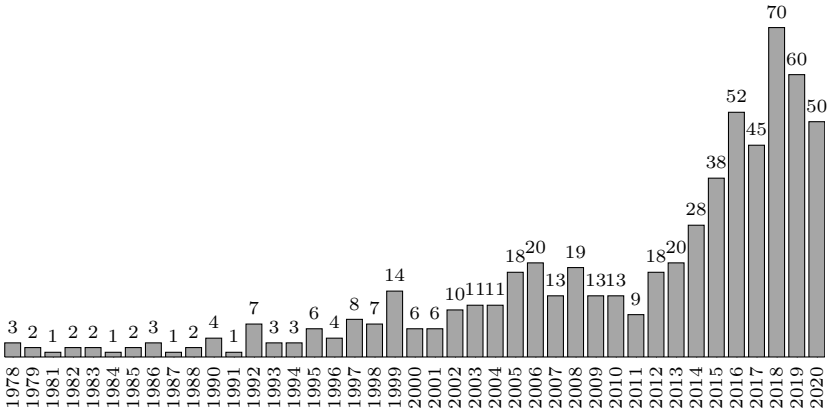

Fig. 4. Number of citations by year.

on *health care delivery and patient safety.*

Second cluster (green) mainly deals with the quality of *education and training* for health professionals, especially in the *United States.* The publications in this cluster investigate the *quality assurance and accreditation* of education and training programs, as well as the *measurement and assessment* of the *clinical competence* and *performance* of health professionals. The publications also compare the quality of education and

training across different health disciplines, such as nursing, dentistry, and medicine.

Third cluster (blue) mainly concentrates on the quality of *continuing medical education* for physicians, especially in *Germany*. The publications in this cluster analyze the *curriculum, methodology, and evaluation* of continuing medical education programs, as well as the *role and influence* of medical societies and organizations on them. The publications also study the effect of continuing medical education on *general practice and family practice*, as well as on the *quality of life* of physicians.

Fourth cluster (yellow) mainly covers the quality of *lifelong learning and adult education* for various learners and educators. The publications in this cluster discuss the *quality control, management, and assurance* of lifelong learning and adult education programs, as well as the *accreditation and certification* of learners and educators. The publications also explore the *teaching and learning methods*, as well as the *evaluation and feedback* mechanisms, that enhance the quality of lifelong learning and adult education.

3.3 RQ3: What are the main sources and networks of the publications on lifelong learning quality, such as the journals, authors, institutions, and countries that publish and collaborate on lifelong learning quality?

The results showed that the publications on lifelong learning quality were scattered across various journals from different disciplines and domains, such as education, health sciences, social sciences, engineering, and business. The most frequent journal was *Journal of Continuing Education in the Health Professions*, with 9 publications (4.1% of the total), followed by *Journal of Continuing Education in Nursing*, with 6 publications (2.8% of the total). The other journals had less than 5 publications each.

The publications on lifelong learning quality involved many authors from different backgrounds and affiliations, but with a low degree of collaboration. The most productive authors were A. V. Antunes, F. A. Gomes, S. Kitto, C. Mendes-Rodrigues, G. S. Mendonça, and E. B. S. Pereira, with 4 publications each (1.8% of the total). The other authors had less than 4 publications each. These publications were produced by various institutions from different countries and regions, but with a moderate degree of collaboration. The most active institution was University of Toronto (Canada), with 10 publications (4.6% of the total), followed by University of Connecticut (US), with 5 publications (2.3% of the total). The other

institutions had less than 5 publications each.

The results finally showed that the publications on lifelong learning quality were originated from different countries and regions around the world, but with a high degree of collaboration. The most dominant country was United States, with 43 publications (19.7% of the total), followed by United Kingdom, with 19 publications (8.7% of the total). The other countries had less than 19 publications each.

4 Conclusion and future work

In summary, our study conducted a thorough analysis of lifelong learning quality research, highlighting its growth and diversity across domains. We identified key themes through keyword clusters, providing insights into topics like continuing education and quality assurance. Our analysis underscores the need for interdisciplinary collaboration and international engagement in this field.

Moving forward, further investigation could delve into the specific content within each keyword cluster, providing deeper insights into challenges and innovations. Longitudinal studies could track evolving trends over time. In conclusion, our study lays the groundwork for continued exploration of enhancing education and professional development quality.

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