Defining The Quality Education – An Extensive Bibliometric Analysis

Maria Lazăr (Staicu)
Lucian Blaga University of Sibiu
maria.staiculazar@ulbsibiu.ro

Abstract
Quality education gains more and more interest from the recent researchers who attempt finding innovative solutions to create a real connection education – skills – employability. Quality education may seem undefined in the research area, but it is integrated in frameworks and guidelines in order to be evaluated by local, regional, or national authorities. As defining quality education in the current context is a global desideratum stated by the Sustainable Development Goals, the present research attempts outlining priority perspectives in illustrating the concept of ‘quality education’ through a bibliometric analysis performed by the application VOSviewer 1.6.18. The study reveals the insights of a bibliographic research within Web of Science resulting in 477 documents that encountered all the relevant criteria. The data was analysed using the application VOSviewer and the study consists of analysing the keywords co-occurrence within the recent international literature. Results draw priority perspectives in defining the quality education in current context. Comparing the results with the present standards of quality education, content gaps may be revealed. Further studies should define new quality education standards in order to recreate an educational quality system able to strengthen the connection education – skills – employability in a dynamic global society.

Keywords: quality education; bibliometric analysis; keyword co-occurrence; education; management

JEL Classification: I20, I29
1. Introduction

Quality education is a global desideratum that was highlighted by the Sustainable Development Goals - SDGs, also known as Global Goals. The 17 Sustainable Development Goals were addressed by United Nations (UN) in 2015 in order to eradicate poverty and bring prosperity worldwide, especially in less developed countries. The fourth goal (SDG 4) emphasizes the importance of quality education access for all the people.

While some researchers (Costa, Santos, & de Oliveira, 2022; Carrillo-Lopez & Hernandez-Gutierrez, 2022) consider ICT (Information and Communication Technologies) and Education 4.0 (E4) to be "essential for a quality education", other authors (Ebersohn, Omidire, & Murphy, 2022) highlight the importance of international partnerships or "education based on values" (Tumlovskaja, 2022). Moreover, the low results at PISA-type testing bring forward the importance of "skills’ education" (Picon & Correa, 2022) in order to achieve quality education and to improve the employability. Furthermore, the concept of quality education may seem undefined (Mufic, 2022), being only contextualized in guidelines in order to be evaluated by local, regional or national authorities.

Quality education – quality of education – quality in education

Before analyzing the quality education, an important stage is identifying similar concepts involved. It is important to distinguish the concepts ‘quality of education’ and ‘quality in education’, concepts that point to quality education, noticing that educational relationships have been emphasized by recent research (Tourinan Lopez, 2022). Three different expressions – quality education, quality of education, quality in education – refer to the same concern of education specialists, theorists and practitioners. Having different reflection in the worldwide education systems, we may notice some common concerns for researchers from different countries.

The bibliometric analysis is an innovative research method used in recent studies (Ogrean & Herciu, 2021; Mihu, Bogoslov, & Lungu, 2021; Cristian, Lazăr, Sitea, & Țâmbalari, 2022) that may reveal notable scientific data. Using an extensive bibliometric analysis by VOSviewer 1.6.18, the research question "How could we define the quality education through a bibliometric analysis of the keywords used in the recent worldwide literature?" should be answered.
research objective aims to **define the concept of quality education using the bibliometric analysis of the keywords from the international literature**. Considering the view that the existence of common keywords may set essential points in defining the concept of quality education, a bibliometric analysis regarding the co-occurrences of a keyword in the international literature will be performed.

### 2. Research methodology

#### 2.1. Choosing the database for the bibliographic research
After setting the research question and objective, another important stage was choosing the database for the bibliographic research. The VOSviewer application allows using files downloaded from Web of Science, Scopus, Dimensions, Lens and PubMed. Web of Science Clarivate was chosen because it is a database that includes papers from different research areas belonging to famous international publications. The papers analysed in Web of Science within this research are indexed ESCI (Emerging Sources Citation Index), SSCI (Social Sciences Citation Index), CPCI-SSH (Conference Proceedings Citation Index – Social Sciences & Humanities), SCI-EXPANDED (Science Citation Index Expanded), BKCI-SSH (Book Citation Index – Social Sciences & Humanities), CPCI-S (Conference Proceedings Citation Index – Science).

#### 2.2. Bibliographic research – identifying the papers
Searching in Web of Science Core Collection, all editions were selected in order to identify the papers. The research was conducted choosing the search field "Topic": *quality education, quality in education, quality of education* with the connectors "OR". The quotation marks brought accuracy to the search as only the precise expressions between the quotation marks were identified. The connector OR assured collecting more papers referring to quality education as one of the similar expressions was identified. Considering all of these searching details, on the 13th of June 2022, 8541 papers included in Web of Science Core Collection, having the topic *quality education, quality of education* or *quality in education* were identified.
2.3. Refining the results

In the process of the results’ refining, there were selected:

- **Open access** papers – to assure the access to information.
- The publication years **2017, 2018, 2019, 2020 and 2021** – to analyze the last five years trend in the domain. The year 2022 was not chosen because it would not have been relevant as displaying the results for a period of only five months.
- **Articles and Proceedings Papers** for Document Types – to gather recent data presented in articles and conferences.
- **Web of Science Categories** **Education & Educational Research and Management**, these ones being relevant for the research objective.
- Articles written in **English** – for a relevant analysis in VOSviewer. A clear analysis of the keywords co-occurrence requires data in the same language and English is used in all the academic areas worldwide.

After refining the results by choosing open access papers, publication years 2017-2021 and Web of Science categories Education & Educational Research and Management, **724** papers remained out of the total of **8541**. As only the English papers were needed, **477** papers were, finally, identified. The non-English articles were written in Spanish (126), Portuguese (64), Russian (40), Turkish (6), Ukrainian (5) and the rest of 6 in French, Latvian, Icelandic and Polish.

3. Analysing the results in Web of Science Clarivate

After refining the results, their analysis was conducted within Web of Science Clarivate considering the Web of Science categories, the publication years, document types, research areas and countries.

Referring to the analysis based on Web of Science categories, it is noticeable that the most numerous documents belong to Education & Educational Research category (450) and on the second position there can be noticed Management category (46), as the paper selection from the refining stage focused on these two categories. There are represented as well other Web of Science categories, such as: Education Scientific Discipline (19), Economics (12), Art (10), Business (9), Social Sciences Interdisciplinary (6), Psychology Applied (5), Psychology
Educational (5). The results analysis based on Web of Science categories can be noticed in Figure 1:

![Fig. 1. The results analysis based on Web of Science categories](source)

Source: Web of Science Clarivate, June 13th 2022

Analysing the results based on publication years, one may notice the researchers’ increasing interest in quality education, starting in 2019 as the number of published documents was double comparing to 2017 and 2018. The year 2020 shows a slight decrease of the published papers, the probability of the pandemic Covid-19 impact in the research field being increased. Starting from 2021 on, there can be observed the increasing trend (Fig. 2).

![Fig. 2. Web of Science papers’ distribution analysis based on publication years](source)
Results analysis within Web of Science based on document types revealed the following data: Articles– 398, Proceedings Papers – 81, Early Access – 13, Book Chapters – 9, as illustrated in Figure 3.

![Document types](image)

**Fig. 3.** Results analysis based on document types

Source: Author’s own sketching (data Web of Science Clarivate, June, 13th 2022)

Papers’ distribution by countries (Fig. 4) revealed the researchers’ interest from every country for the research field of quality education. Consequently, among the first ten countries there can be noticed Russia – 55 papers, South Africa – 46, England – 44, China – 44, Spain – 30, United States of America – 29, Netherland – 28, Turkey – 22, Ukraine – 19, Australia – 16. Romanian researchers’ interest for quality education study places Romania as the 25th country, having 6 published papers during the last five years.

![Papers’ distribution by countries](image)

**Fig. 4.** Papers’ distribution by countries

Source: Author’s own sketching (data Web of Science Clarivate, June, 13th 2022)
3.1. Results exporting

After refining and analysing the search results in Web of Science, the results were exported plain text file format, recordings 1-477, selecting as recordings’ content – Full Record and Cited References.

3.2. Creating maps using the application VOSviewer

Attempting to define the concept of quality education based on the bibliometric analysis of the keywords co-occurrence within the international literature, two maps were created, being different from a depth perspective. The first map should be the framework of the concept quality of education by emphasizing the general points in defining the concept. The second map aspires to draw deeper points in defining the concept and the emphasis is on the integration and analysis of more keywords from the international literature.

3.3. Map based on bibliographic data – keyword co-occurrence (minimum two co-occurrences)

The first map framed the concept quality of education. The 477 analyzed papers resulted from the search based on Topic. The search fields were quality education, quality in education, quality of education with the connectors OR. The results were refined based on publication years (2017-2021), document types (articles and proceedings papers), Web of Science categories (Education & Educational Research and Management), the language of documents (English) and open access papers.

Starting with the first map, there was selected the map creation based on bibliographic data. The second stage was reading the data from bibliographic database files – Web of Science. Next stage was loading the bibliographic database file downloaded from the Wb of Science – plain text file type. Referring to the type of analysis and the counting method, co-occurrence was chosen as type of analysis, all keywords as unit of analysis and full counting as counting method. There were identified 213 keywords used in all the documents exported from Web of Science.

Next stage was selecting the minimum number of co-occurrences of a keyword, choosing the threshold 2. This choice allowed highlighting the most used keywords, establishing the reference points in defining the concept ‘quality education’ from the view of this bibliometric analysis. Choosing a higher threshold than 2 would have resulted a low number of keywords which would
have meant impossibility in creating a relevant map. Consequently, choosing the threshold 2 for this bibliometric analysis (minimum two co-occurrences of a keyword), only 18 out of 213 keywords met the threshold. These 18 keywords were used for creating the map. For each of the 18 keywords, the total strength of the co-occurrence links with other keywords was calculated and there were chosen the keywords with the greatest total link strength. Moreover, only 17 out of the 18 keywords were connected and they are illustrated within the first map (Fig. 5).

**Fig. 5.** VOSviewer map – keyword co-occurrence (minimum 2 occurrences of a keyword)

Source: VOSviewer 1.6.18

Analysing the results by VOSviewer 1.6.18, the first map was created with 17 keywords included in 6 clusters, having 34 links and 38 total link strength.

**Cluster 1** includes 3 keywords: disability, inclusive education, quality education. **The second cluster** reveals the following keywords: knowledge, lifelong learning, policy. **The third cluster** highlights a new set of keywords: education, parental involvement, quality. **Cluster 4** integrates other keywords with a high relevance within the quality education field: educational environment, quality of education, secondary education. In **Cluster 5**, three keywords are emphasized: management, service quality, teachers, while **the last cluster** highlights two keywords: perceptions, students.
The first analysis emphasizes the following essential factors within quality education: management, teachers’ quality, inclusive education, the importance of parents’ and students’ involvement in the educational process as education stakeholders, assuring a high-quality educational environment, as well as encouraging the lifelong learning process for all the categories of people.

3.4. Map based on bibliographic data – keyword co-occurrence (minimum one co-occurrence)

The same stages when creating the first map were pursued:

- Selecting *Create map based on bibliographic data*;
- Selecting *Read data from bibliographic database file* – Web of Science;
- Loading the bibliographic database file downloaded from the Web of Science – plain text file type.;
- Selecting type of analysis (*co-occurrence*), unit of analysis (*all keywords*) and counting method (*full counting*). There were identified 213 keywords used in all the documents exported from Web of Science.
- Choosing threshold 1 – minimum one co-occurrence of a keyword. All the 213 keywords met the threshold.
- For each of the 213 keywords, the total strength of the co-occurrence links with other keywords was calculated and there were chosen the keywords with the greatest total link strength.
- Only 168 out of the 213 keywords were connected and they are illustrated within the second map.
- There are 640 links, having the total link strength – 644.

After analyzing the results by VOSviewer 1.6.18, the second map of keyword co-occurrence (minimum one co-occurrence) was created as illustrated in Figure 6. There are 168 keywords distributed in 18 different coloured clusters.
In **Cluster 1 (red)**, 17 keywords are revealed. The most important ones are mentioned: *inclusive education, educational inclusion, disability, educational policy, reflective teaching, teacher listening, context, Covid-19, educational relationships, inclusive practice, primary teachers, teacher efficacy, transformative learning*. Some important points should be noted – the **importance of inclusive education** for quality education and the essential role of teachers in order to succeed in implementing the educational policies.

**Cluster 2 (green)** reveals 16 keywords: *lifelong learning, knowledge, comparative education, access to education, secondary education, demonstration, teaching aids, educational quality, elementary school curriculum, factor analysis technique, growth, mathematics education, PISA, sustainable development goals – sdgs, teaching practices, technologies*. The cluster highlights the importance of lifelong learning included in the Sustainable Development Goals (SDGs). There should be also noted the importance of PISA’s results as a reflection of educational systems’ readiness for creating a real connection educational content – skills – employability.

**Cluster 3 (blue)** includes 16 keywords, having *management* as central element: *budgets, principals, teachers, service quality, total quality management, satisfaction, school improvement, class size, governing bodies, high school, secondary schools, school fee exemptions, school fees, teacher-learner ratio, students’ perceptions*. The high interest for *educational management*
should be noted within this cluster, highlighting the financial management and the human resources management.

In Cluster 4 (khaki) 14 keywords can be noticed, being grouped around the keyword access: socio-economic factors, geography, Africa, Sub-Saharan Africa, Sub-Sahara, urban population, children, school-age population, parental consent, choice, equality, inequality, surveys, and questionnaires. There should be highlighted out of this cluster the importance of access to education, with emphasis on solving the issue equality – inequality, especially within disadvantaged geographical areas, the population school age being also an important item to measure the quality of education in a performant educational system.

In Cluster 5 (purple) the keyword quality of education is remarkable, and it gathers around it 12 more keywords: challenges, analytic hierarchy process, prioritization of factors, convention theory, education export, Finnish teacher education, framework, Islamic education, Malaysian private higher institutions, quality conventions, secondary school, thematic analysis In this cluster quality education should be noted and the influence of educational conventions and prioritization of factors.

Cluster 6 (turquoise) outlines the keyword education, identifying others around it: education quality, monitoring, corruption, cost, delivery, Egypt, university graduates, private tutoring, school, system, teacher pay. The interest for human resources quality is revealed out of this cluster, being illustrated by private tutoring and teacher pay.

Out of Cluster 7 (orange) the keyword students is emphasized, being followed by 9 more keywords: 2d model, learning, evaluation criteria, professional training, improvement, logical analysis, Olympiad, physical education (PE), university. Out of Cluster 7 there should be noted the interest in students, as essential stakeholders, as well as their performance in learning, highlighting evaluation criteria, Olympiad.

Cluster 8 (brown) highlights other important stakeholders, parents. The central keyword connecting the others is parental involvement and the other 8 keywords included in the cluster should be mentioned: capabilities, school choice, refugee integration, refugee children, Chile, English as an additional language, Syrian refugees, elementary. The emphasis within this cluster is on the importance of parents’ involvement, of refugee children integration, as well as of learning a foreign language.
Referring to **Cluster 9 (light purple 1)**, there can be noticed the following keywords: *policy, age, agency, structure, globalization, governance, legislation, unionism, world society*. **Legislation** and **structures integrated in global policies** should be noted.

**Cluster 10 (pink)** includes 8 keywords, the ones with the highest link strength being mentioned: *quality, perceptions, employability*. The other keywords complete the cluster’s image: *personal qualities, relationships, standards of quality assurance in higher education, teaching, and learning*. The importance of **perceptions, of personal qualities and relationships** needed in **employability** formation are emphasized.

In **Cluster 11 (light green)** the keyword *educational environment* may be distinguished, followed by *assessment of the educational environment and infrastructure*. The following expressions complete the cluster’s image: *quality education services, student perceptions, student satisfaction, Vietnam*. The relevance of the *educational environment* should be noted in order to increase the degree of students’ satisfaction and, obviously, to improve the quality of education.

**Cluster 12 (light purple 2)** reveals the following keywords: *adolescent girls, concept, education integration, music integration, quality education, quality learners, teaching reform*. **Education integration** should be noted within this cluster.

**Cluster 13 (cream)** emphasizes the keywords: *Erasmus Mundus, higher education policy, international mobility, study abroad decision dynamics, user-experience research, UX in education design*. This cluster outlines the importance of study abroad through different **international mobility** projects, as well as **user-experience research (UX)** and **educational design**.

In **Cluster 14 (light purple 3)** six keywords are identified: *identity, place, language identity, minority language, Nepal, South Asia*. This cluster highlights the importance of keeping **identity** in a performant and tolerant educational system.

**Cluster 15 (light blue)** highlights the following keywords: *English language, examination, examination special centres, examination malpractice, perceived effect*. There should be noted the interest in examining and learning English as means of communication needed in any competitive educational system.
As noticed in **Cluster 16 (light orange)**, evaluation is emphasized and five keywords may be noted: *evaluation, school self-evaluation, school self-evaluation framework, primary schools, Zimbabwe*.

**Cluster 17 (light purple 4)** reveals a high interest for **artificial neuronal network** and for **skill education** by illustrating three keywords: *artificial neuronal network (ANN), evaluation of integration effect, skill education*.

**Last cluster** highlights the importance of universities by mentioning the following three keywords: *colleges and universities, ideological and political courses, method*.

The second analysis reveals a larger and more varied record of keywords highlighted at every cluster. As expected, they offer significant data needed for defining the concept of quality education.

4. Conclusions and defining the concept *quality education* based on data obtained from the bibliometric analysis

Following the two bibliometric analyses using the application VOSviewer, significant data were achieved that will support drawing the definition of quality education. Based on information collected from the second VOSviewer analysis, an essential area in defining quality education is occupied by **legislation (Cluster 9)**, being completed by **educational conventions (Cluster 5)** according to the interest points of every region or country. **Prioritisation of factors (Cluster 5)** becomes an important point in the management of quality education, as noticed in **Figure 7**.

![Fig. 7. Quality education](image_url)

Source: Author’s own sketching
Concurrently, the data highlighted by both VOSviewer analysis revealed information referring to priority perspectives in defining the concept ‘quality education’, as illustrated in Figure 8. Consequently, the following points become essential in defining quality education: inclusive education, lifelong learning, educational management, human resources quality, students’ results and the evaluation system, employability, parents’ involvement, educational stakeholders’ involvement, educational environment, international mobility, user’s experience (UX) and educational design, evaluation, and self-evaluation.

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<tr>
<th>Priority perspectives in defining the concept ‘quality education’</th>
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<tr>
<td>Inclusive education</td>
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<td>Lifelong learning</td>
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<td>Educational management</td>
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<td>Human resources quality</td>
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<td>Students’ results and evaluation system</td>
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<td>Employability</td>
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<td>Educational stakeholders’ involvement</td>
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<td>International mobility</td>
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<td>User’s experience and educational design</td>
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<td>Evaluation and self-evaluation</td>
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Fig. 8. Priority perspectives in defining the concept ‘quality education’
Source: Author’s own sketching

For every priority perspective, some important points were detailed. These points can be operationalised in specific items.

Summarising, the concept of quality education can be defined through a bibliometric analysis. Analysing the keywords co-occurrence within the recent international literature (2017-2021), important data related to researchers’ interest in the domain was collected. Detaching the elements with the highest co-occurrence in the literature, current points of interest of quality education were distinguished. These points have the capacity to define the concept quality education. Comparing the priority perspectives and quality standards in education at national level, content gaps specific for every country can be revealed. Gaps can be evaluated and analysed in order to recreate a new evaluation system of quality education and further studies
should be conducted. Identifying these inconsistencies may be the first step in the process of actualisation and alignment to new demands in a global context reflected by recent studies included in the bibliometric analysis.

References


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