EDUCATION SECTOR OPEN GOVERNMENT:
A BIBLIOMETRIC ANALYSIS

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Abstract. The aim of this research is to analyze open government bibliometrics in the education sector. Education is one of the most popular fields in open government. This research uses a qualitative approach with bibliometric analysis methods. The data used is secondary, obtained from the Scopus database. Data was collected using Publish or Perish with the keyword education sector open government. The data obtained was then selected using OpenRefine and analyzed using VOSviewer to obtain a bibliometric map generated from keywords throughout the paper. Based on the results of this research, there have been 160 papers in the last 51 years. The first open government paper on the education sector was published in 1972. There are 17634 citations, 75 h-index, and 126 g-index, which shows this paper has high impact and productivity. In this paper, there are 153 keywords grouped into 13 clusters. From these keywords, 1878 total link strengths and 663 occurrences were obtained. The keywords that dominate this paper are open policy making, social auditing, open contracting, and open budgeting. This shows that open government studies in the education sector focus on these issues.

Keywords: Bibliometric Analysis, Education Policy, Open Government

INTRODUCTION

More globally, open government is a recalibration of power dynamics between the government and citizens (Afandi et al., 2023; Erdayani et al., 2023b). It returns power to the hands of citizens, with the understanding that government structures will become more democratic and empowering and that government mechanisms will be improved and made more effective by aligning government activities with the actual needs and demands of citizens (Afandi et al., 2023; Afandi et al., 2023). Education is one of the most popular policy areas in the Open Government Partnership (OGP). Since 2011, OGP countries have made more than 200 commitments in the field of education (Erdayani et al., 2023c; Erdayani et al., 2023b). The most popular commitments focus on open educational resources that include IT tools and platforms. Globally, 387 million children of primary school age (56 percent) and 230 million adolescents of junior high school age (61 percent) do not reach the minimum proficiency level (Gondol & Allen, 2020). These learning gaps not only limit the opportunities of these children, they also limit the growth and prosperity of entire countries.

In the education sector, open government refers to the openness of government data, decision-making processes, and control mechanisms for public involvement and supervision, with the aim of ensuring inclusive and fair education quality (Erdayani et al., 2023a). Calls for renewed government-citizen interactions, combined with the development of new technologies, have encouraged governments to seek innovative ways not only to share information but also to actively consult and involve the public in the delivery of educational services (Afandi & Anwar, 2017). The open government declaration adopted in 2011 states that signatory countries must foster a global culture of open government that empowers and provides services to citizens, as well as advancing the ideals of open and participatory 21st century government (Zulfa & Afandi, 2023). Initiatives to introduce open government can be carried out at all levels of the education sector, from the central level to schools.

The main principles underlying the concept of open government are transparency, citizen involvement, and accountability (Afandi, et al., 2022). Transparency is defined as the extent to which the government provides the data and documents the public needs to assess government actions and exercise a voice in decision-making. Citizen involvement, namely encouraging the participation and collaboration of the public when planning, implementing, monitoring, or evaluating new policies or projects. Accountability means the obligation of government authorities to be responsive to the needs, requests, and possibly also complaints of citizens (Afandi & Afandi, 2018; Afandi et al., 2023).
METHOD

This research uses a qualitative approach with bibliometric analysis methods. Bibliometric analysis is a method used to analyze scientific literature in a particular field of knowledge or topic. This method is used to identify trends and highlight critical insights generated from scientific literature (Gaviria-Marin & Baier-Fuentes, 2019; Kulsum et al., 2022). This research uses secondary data sourced from the Scopus database.

Research data was collected using Publish or Perish with the keyword open government sector education. Publish or Perish data is selected using OpenRefine with open access paper criteria and is in line with the main principles of open government: transparency, citizen involvement, and accountability. The data is then saved in RIS file format, entered into Mendeley to complete the file details, especially keywords, and then saved again in RIS file format to be analyzed using VOSviewer to obtain a bibliometric map sourced from keywords in the scientific literature used. Data that has been selected using OpenRefine and identity data that has been completed using Mendeley is then input into VOSviewer (to produce network visualization, overlay visualization, total link strength, and occurrences).

RESULTS

Open government studies in the education sector in the Scopus database were first recorded in 1972. This shows that studies in this field have long been the focus of researchers. As of November 2023, there have been 160 publications, 17634 citations, 345.76 citations per year, 75 h-index, and 126 g-index. The H-index is an index that measures the productivity and impact of papers published by researchers. This index is based on the number of papers produced by researchers and the number of citations received from other publications. Similar to the h-index, the g-index is a citation metric at the individual author level. However, this index is calculated based on the distribution of citations received by research papers and the average number of citations.

Figure 1. Network visualization
There are no duplicate keywords displayed in the visualization above. Identical keywords that appear in many papers are counted as a single keyword. Certain keywords do not appear in this visualization to prevent overlap. This visualization represents keywords with labels and circles. The sizes of labels and circles are determined by their respective weights. The more often a keyword appears, the bigger the resulting label and circle (Gaviria-Marín et al., 2019). The visualization above divides keywords into 13 clusters (table 1) and certain colors. The lines between keywords represent links, and the closer the keywords are, the closer the connection is (Ham, Koo, & Lee, 2019; Lnenicka & Saxena, 2021).

![Visualization](image)

**Figure 2.** Overlay visualization

The overlay visualization is identical to the network visualization (Figure 1), except for the colors. In this visualization, keyword colors range from blue (the lowest score), green (the middle score), to yellow (the highest score). In the open government paper in the education sector, keywords with the latest publication year include social auditing, community awareness, education system, official oversight, space creation, and supervision mechanisms. This shows that researchers' studies are currently focusing on these issues.

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>basic information, contract renewal, corruption opportunities, education budget, goods quality, open contracting, performance indicators, procurement method, procurement plan, procurement process, project thinking, public needs, public procurement, school equipment, school renovation, selection process, service quality, stakeholder involvement, technical document, tender information, transparent procurement</td>
</tr>
<tr>
<td>2</td>
<td>accountability, budget, budget allocation, budget cycle, budget decisions, budget information, budget integrity, budget literacy, budget monitoring, budget process, citizen suggestions, corruption risk, local democracy, open budgeting, public access, resource allocation, resource priorities, responsiveness, transparent information</td>
</tr>
</tbody>
</table>
3 annotation platform, artificial intelligence, communication platform, consultation process, creation process, crowdsourcing platform, digital divide, open policy making, policy design, policy preparation, problem analysis, project documents, resource support, response analysis, responsive practice, traditional communication, transparent communication

4 collaborative approach, dynamic needs, educational project, educational reform, local approach, policy cycle, policy development, policy evaluation, policy formulation, policy implementation, policy monitoring, policy revision, providing information

5 administrative officials, data confidentiality, discretionary authority, diversification approach, government decision, open policy, policy making, poor society, privacy protection, public authority, solution range, specific stages

6 bidding procedures, civil monitoring, community mobilization, contract implementation, contractual openness, corrupt practices, decision feasibility, integrity pact, representative panel, selection criteria, service performance, society participation

7 budget discussion, budget transfer, educational community, educational improvement, government authority, information platforms, local government, public participation, public scrutiny, sharing information, special budget

8 community awareness, data collection, education system, government policy, government responsibility, official information, official oversight, project implementation, social auditing, space creation, supervision mechanism

9 citizen awareness, education authority, education policy, information access, information rights, project monitoring, project verification, public interest, public rights

10 authority accountability, contract evaluation, contract monitoring, information openness, procurement chain, providing access, public contract, tender issuance, tender planning

11 bureaucrat, community capabilities, decision maker, decision making, education administration, financial decisions, public communication, resource management

12 citizen report, information review, project cycle, project usability, public opinion, summative evaluation

13 contract data, contract procedures, information platform, online platforms, reporting violations

There are 153 keywords in the open government paper in the education sector. Keyword clusters are formed based on connecting lines between keywords (Figure 1) so that each keyword in the same cluster is closely related. Meanwhile, keywords that have large labels and circles (Figure 1) are based on the total link strength and occurrence scores.
There are 1878 total link strengths and 663 occurrences of all open government paper keywords in the education sector. Open policy making (total link strength 124 and occurrences 42), social auditing (total link strength 120 and occurrences 40), open contracting (total link strength 116 and occurrences 39), and open budgeting (total link strength 113 and occurrences 39) are a list of keywords that dominate. Total link strength shows the total link strength of a keyword, while occurrences show the total appearance of a keyword in all papers (Safarov, 2019). The keywords above are the most familiar ones used by researchers and are the focus of open government studies in the education sector.

**Open Policy Making**

Open policy making refers to the use of a collaborative approach to provide information and develop policies that meet the dynamic needs of citizens (Alexiadou & Lange, 2023). Open policy making must be carried out at various stages of the policy cycle, from problem identification to policy formulation, drafting, revision, implementation, monitoring, and evaluation (Thompson & Cook, 2019; Zahariadis, 2020). This can occur at the national level (for example, when new educational laws or reforms are being prepared) or at the regional or school level when educational policies or projects of a more limited scope are being debated (Moutsios, 2020).

A local-level approach is essential to ensure that the perspectives and needs of disadvantaged groups are taken into account. Only by bringing in new actors can policymaking broaden the range of possible solutions, thanks to diversified and updated sources of information, viewpoints, and approaches (Tan, 2022; Vikashkumar, 2020). Opening specific stages in the policy-making process, including problem analysis, developing solutions, and
providing comments on draft policy or project documents, requires sufficient time and resources (Walker, 2019). Smooth and efficient open policy making requires that the objectives of the consultation process be clearly defined from the start, based on transparent information and communication, and the main issues put forward for discussion must also be clearly described.

Public authorities must decide whether they want to open the consultation process to anyone interested in participating or limit it to a certain number of people (e.g., a panel of citizen representatives). In this case, the selection criteria must be clearly defined because they will determine the legitimacy of the input provided (Shiroma, 2019). Multiple communication platforms should be considered for gathering feedback: traditional communication platforms to limit the impact of the digital divide; more high-tech ones, such as annotation platforms for collectively drafting policies or project documents; and crowdsourcing platforms that enable faster clustering and analysis of responses through artificial intelligence (Lawn, 2021; McCann & Ward, 2019).

One important responsibility for public authorities is to ensure that their conclusions reflect the diversity of opinions expressed while achieving consensus. When the opinions of some people are ignored, this can lead to frustration, tension, or even conflict (Marchi et al., 2019). Public authorities have an obligation to provide participants with information about how they use the feedback received and how final decisions are taken. All participants must receive assurances of confidentiality for their input and be assured that their privacy will be protected.

When engaging in open policymaking, public authorities accept the principle that citizens should be informed and should be able to influence decisions taken on their behalf. As a result, ambiguity in various government considerations and decisions will tend to decrease (Ball, 2019; DeBray-Pelot & McGuinn, 2019). By limiting the discretionary power of public administration officials and redefining policymaking as a process of co-creation for the common good, an environment is created that encourages integrity, good behavior, and responsive practices.

**Social Auditing**

Social auditing refers to the monitoring of an educational project or policy over time by its direct beneficiaries, with the aim of meeting predetermined project or policy objectives (Terwindt & Armstrong, 2019). This approach was introduced in countries such as India in the late 1990s as part of the right to information movement, with the principle that citizens should be able to access information in the public interest, to hold educational authorities accountable,
and to be heard (Ghonkrokta & Singh, 2019). Things that must be considered in social auditing are increasing citizens' awareness of their rights, giving them the opportunity to show whether they have received what is their right or not; allowing them to verify whether the project or policy under study has been implemented in accordance with official rules and whether the project or policy has achieved its stated objectives; and discussing the relevance, efficiency, and usefulness of the project or policy to them with the opportunity to suggest possible improvements (Chawla, 2021; Hay, 2020). Social audits can be conducted at critical moments in a project or policy cycle, or at the last minute, as a summative evaluation.

Social audits can be conducted in various forms, including public hearings, citizen or school report cards, community scorecards, and by adopting a variety of appropriate methodological approaches. This usually includes reviewing information provided by public authorities but also requires collecting additional data directly from end users, utilizing their testimonials and experiences according to established protocols (Peicheva et al., 2020). Designed as a complement or alternative to official oversight mechanisms, social audits are often facilitated by civil society or community organizations responsible for coordinating citizens' actions.

Social audits are key to increasing ‘community awareness’ and monitoring the implementation of government projects and policies. They can help uncover corrupt practices in various ways: first, by encouraging the public to pay more attention to the regulations and functioning of the education system; second, by comparing official information with information provided by end users; and third, by facilitating exchanges with those responsible for projects or policies and then holding them accountable (Owen et al., 2020). More globally, by rebalancing roles and responsibilities, social auditing can help prevent abuse of power. Social audits also result in the creation of new spaces where citizens and officials can come together for dialogue and better collective decision-making (Yesudian, 2019). Social audits can increase society's ability to move beyond mere protest and/or apathy towards a process that helps engage bureaucrats and decision-makers in a more informed, organized, constructive, and systematic manner, thereby increasing the chances of positive change occurring.

Open Contracting

Open contracting refers to the full disclosure of information regarding public contracts throughout the procurement chain, with public participation at every step of the process, from issuing tenders to monitoring and evaluating contract implementation (Castro et al., 2022). Important stages in open contracting include disclosure of information to the public regarding
identification of needs, tender planning, and specification of selection criteria; providing access to documentation relating to the procurement process, from tender invitations to contract awards; and holding public authorities accountable for the quantity and quality of goods or services produced (Locatell, 2023).

Open contracts should be applied to various areas in the education sector that require public procurement, especially in the construction and renovation of schools, as well as the purchase of school equipment and textbooks (Buerger & Harris, 2020). Open contracting practices offer many advantages: they can help ensure that the need for new tenders is real, that the specifications are clear, that the entire procurement process is transparent, and that the goods or services meet quantitative and qualitative requirements that are determined and in line with community needs (Rho, 2020). Implementing open contracts requires stakeholder involvement in key steps of the process. Information about tenders, along with supporting documents, is shared with the general public (Schomaker, 2020). This may include the project rationale, basic cost and budget information, technical documents and feasibility studies, notification of procurement plans, procurement methods, contracts awarded, contractor names, contract renewals, performance indicators, as well as appeals and procurement decisions (Alwahbi, 2020).

Various stakeholders should be given the opportunity to provide feedback and raise concerns at several stages of the procurement process. This can be realized in the form of an integrity pact. Both companies and civil society organizations should be consulted at the pre-auction stage to discuss selection criteria and bidding procedures (Graycar, 2019). Community participation is sought to monitor the implementation, completion, and performance of the services provided. What is often referred to as civil monitoring of contract implementation consists of the mobilization of civil society groups, end users, or young people to document contract implementation, report possible deviations, and suggest appropriate improvements (Burch, 2020).

Open contracts can be implemented at all administrative levels. However, because contract procedures are often carried out at the national level, there is a need for some kind of versatile online platform to collect all contract data in one place and make it available (Zheng et al., 2020). In addition to information platforms, digitizing each step of the procurement chain can greatly facilitate consultation, feedback, and monitoring processes. This requires large investments in time, expertise, and technology by government authorities (Zou et al., 2021).
Public contracts are often considered a source and opportunity for corruption and fraud in government. This includes unpublished invited tenders; bidder collusion to raise prices; favoritism or giving bribes in the selection process; and fraud regarding the quantity or quality of services, materials, and equipment provided (Fazekas & Wachs, 2020). By increasing the capacity to monitor contract bidding and implementation, contract transparency can help identify red flags and anomalies, question the appropriateness of decisions taken, and reveal deficiencies in contract implementation caused by corrupt practices.

**Open Budgeting**

Open budgeting refers to public access to budget information in education-related processes, with opportunities for citizens to participate in the budget cycle (Bilge, 2020). The level of community involvement is community access to transparent information regarding budget allocations and expenditures, consultation with the community regarding budget decisions, especially regarding resource allocation priorities, and active community involvement in all decisions made in the budget cycle, from resource allocation to use and control (Mou et al., 2019). Open budgeting must be carried out at all levels of education system administration, from the central level to the local and school levels. Over the last decade, a number of initiatives have been carried out, especially at the local and school levels (Pratolo et al., 2020). This approach is based on the idea that by encouraging dialogue between administrative staff, teachers, parents, and students and by giving them a voice in financial decision-making, open budgeting can encourage more efficient and informed management of resources that focuses on community needs (Sangiumvibool & Chonglertham, 2020).

The quality and quantity of activities involved in implementing the open budgeting process depend on the level of community involvement. Information platforms are provided by government authorities to share information with the public regarding the national education budget, local education budgets, and budget transfers to schools (Mosala & Mofolo, 2021). Opportunities for communities to participate in budget discussions begin at the national, local, or school level. Such discussions involve community representatives, who sit in formal deliberative structures, for example. Parliament at the national level, regional councils at the district or city level, and school management committees at the school level (Zierdt, 2019).

Citizens are invited, most often by local government, to submit ideas for improving school life; they are encouraged to brainstorm collectively and convey their ideas. Open budgeting requires flexibility from government authorities if they are to align their priorities with the expressed needs of the educational community as a whole (Newman, 2020). It also requires a
dedicated budget, set aside for the sole purpose of ensuring adequate information and time are available for participation and to fund any citizen proposals that may arise (Kenno et al., 2021).

Corruption risks exist at every step in the budget cycle. For example, allocation of funds based on increasing participation rates, embezzlement of funds during transfers from the center to regions or to schools, and inappropriate payments made with these funds (Montes & Piñeiro, 2022). By subjecting the entire budget process to public scrutiny and highlighting the possibility of clientelism and other malpractice, open budgeting practices will help reduce these risks and encourage public authorities to be more responsive and accountable. Open budgeting helps foster budget literacy in society, starting with the younger generation (Abdullahi & Kadir, 2020). Gradually providing the knowledge and skills necessary to understand budget cycles and processes, analyze and advocate for them, and carry out budget tracking and monitoring can help build an environment that is more conducive to budget integrity. It can also safeguard local democracy by giving citizens a voice in deliberations aimed at channeling resources and allocating funds in the best interests of all parties.

CONCLUSION

Open government studies in the education sector have attracted the attention of researchers for a long time and have had high impact and productivity. Open policymaking, social auditing, open contracting, and open budgeting are the main issues in this field. Open policymaking refers to using a collaborative approach to provide information and develop policies that meet the dynamic needs of citizens. Social auditing refers to the monitoring of a project over time by its direct beneficiaries with a view to meeting predetermined project or policy objectives. Open contracting refers to the full disclosure of information regarding public contracts throughout the procurement chain, with public participation at every step of the process, from issuing tenders to monitoring and evaluating contract implementation. Open budgeting refers to public access to budget information, with opportunities for citizens to participate in the budget cycle.

ACKNOWLEDGMENTS

We are grateful to the Institute for Research and Community Service at Universitas Islam Negeri Sultan Syarif Kasim Riau for their assistance.
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