Indonesian Journal of Education Research (IJoER)
Vol. 7, No. 3, June 2026, pp. 293~302
ISSN: 2722-1326, DOI: 10.37251/ijoer.v7i3.2743

The Impact of Publicly Funded Research Education: A Systematic Literature Review

Cecille T. Godin
Institute of Advanced Studies, Davao del Norte State College, Panabo City, Davao del Norte, Philippines

Article Info

Article history:

Received Jan 29, 2026
Revised Apr 27, 2026
Accepted May 12, 2026
Online First Jun 13, 2026

Keywords:

Education
Knowledge Translation
Publicly Funded Research
Research Funding
Systematic Literature Review

ABSTRACT

Purpose of the study: This study aims to examine how the outcomes and effectiveness of publicly funded research in education are assessed by reviewing existing literature. It focuses on how research outputs are translated into educational practice, policy, and institutional improvement, with the goal of informing decision-making, strengthening research utilization, and guiding future studies in education.

Methodology: A systematic review methodology was employed to analyze published studies on publicly funded educational research. Relevant literature was retrieved from Google Scholar and organized using EndNote. The PRISMA framework guided the study selection process, resulting in 18 publications from 2000 to 2023. Thematic analysis was used to examine how studies assess research utilization, knowledge transfer, and outcome evaluation in educational settings.

Main Findings: The review identified two main themes: (1) Assessment of Knowledge Translation and Research Utilization, which focuses on how research findings are evaluated in terms of their application in educational practice and decision-making; and (2) Evaluation of Funding Priorities and Research Outcomes, which highlights how funding structures influence research productivity, dissemination, and measurable educational outcomes. Overall, the findings show that publicly funded research contributes to educational improvement when supported by clear mechanisms for evaluating knowledge use, collaboration, and institutional change.

Novelty/Originality of this study: This study is novel in that it integrates research impact frameworks with educational evaluation theories to systematically examine how publicly funded research in education is assessed and translated into measurable outcomes. It is original in shifting the focus from general discussions of research impact to a structured analysis of evaluation processes, thereby addressing a key gap in how educational research effectiveness is conceptualized and measured.

Corresponding Author:
Cecille T. Godin
Institute of Advanced Studies, Davao del Norte State College, Panabo City, Davao del Norte 8100, Philippines
Email: godin.cecille@dnsc.edu.ph

1. INTRODUCTION

Publicly funded research refers to scientific or academic projects financially supported by public resources, often through government organizations or institutions [1]. This type of research is critical for furthering knowledge, meeting societal requirements, and promoting the public good [2]. It plays a crucial role in driving innovation, exploring new horizons, and addressing complex societal challenges [3]. Researchers who

receive grants or funding from public sources to conduct their studies—often in collaboration with universities, research institutions, or other organizations—are responsible for carrying out publicly supported research [4]. The outcomes of publicly funded research are commonly disseminated through research papers, reports, or publications to contribute to collective knowledge and benefit the wider community [5].

In educational settings, publicly funded research has numerous significant implications [6]. It enables the analysis of educational practices, policies, and interventions in order to develop effective strategies for improving teaching and learning outcomes [7]. Such research supports evidence-based educational decision-making, allowing policymakers and educators to make informed choices regarding curriculum development, instructional methods, and resource allocation [8]. Furthermore, publicly funded research contributes to the professional development of educators by providing valuable insights and research-based best practices [9]. Ultimately, it promotes continuous improvement in educational systems, leading to enhanced educational experiences and improved student outcomes [10].

However, the COVID-19 pandemic has significantly affected publicly funded research [11], [12]. Research activities were disrupted by laboratory closures, travel restrictions, and limitations on in-person data collection, resulting in project delays and interruptions [13]. Research priorities and funding allocations also shifted toward COVID-19-related studies, diverting resources away from other areas of investigation [14]. At the same time, the pandemic underscored the importance of public health research and the need for timely, evidence-based information to support policymaking and public health interventions [15]. Moreover, the global crisis stimulated international research collaboration [16], [17] and increased academic data sharing [18], contributing to a more integrated and collaborative global research ecosystem [19].

Several major challenges confront publicly funded research in universities and research institutions [20]. One such challenge is the highly competitive nature of securing public funding [21], which may result in funding gaps and limited resources for research projects [22]. Additionally, increasing pressure to generate rapid practical outcomes or commercialize research may undermine fundamental or long-term research objectives [23], [24]. Bureaucratic procedures and administrative burdens associated with public funding can further delay research activities and reduce project efficiency [25]. Balancing academic independence with accountability and transparency in the use of public funds also remains a complex issue [26], requiring careful navigation to ensure ethical and responsible research practices [27].

This study is not the first literature review to examine publicly funded research. For example, Cruz Rivera et al. [28] conducted a systematic review of methodological frameworks for assessing healthcare research impact, highlighting positive outcomes across multiple domains, including knowledge generation, enhancement of research capacity, policy influence, health improvements, and wider economic benefits. Similarly, earlier work demonstrated that methodological approaches such as econometric analyses, surveys, and case studies—when properly designed and implemented—can effectively capture the economic and social benefits generated by publicly funded research [29].

In the field of education, existing literature reviews on publicly funded research remain limited and conceptually fragmented. Most studies emphasize general benefits such as improved teaching practices or policy influence but fail to explicitly examine how research impact is assessed, operationalized, or measured within educational evaluation systems. This represents a significant theoretical and methodological gap, particularly in linking research impact frameworks with educational evaluation models.

Accordingly, this study addresses this gap by conducting a systematic literature review guided by the PRISMA framework, focusing on how publicly funded research in education is assessed, evaluated, and translated into measurable educational outcomes. By integrating research impact theory with educational evaluation frameworks, this review develops a structured understanding of how research contributes to educational improvement beyond general assertions of impact.

This study is both novel and urgent as it responds to the disconnect between the production of publicly funded educational research and its systematic evaluation in practice. While research impact is widely discussed, few studies have synthesized how it is operationalized through formal educational evaluation frameworks or how it leads to measurable improvements in teaching, learning, and institutional performance. This gap limits the ability of policymakers and educational leaders to fully leverage research evidence for decision-making and accountability. In response, this study aims to systematically review and synthesize existing literature on publicly funded research in education, with particular emphasis on how its outcomes are assessed and evaluated in relation to educational quality and improvement.

2. RESEARCH METHODS

This systematic study adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for reporting systematic reviews [30]. Given that the research context remains underexplored and its dynamics are not yet well understood, a qualitative systematic review was considered an appropriate methodological approach for investigating this topic.

The following research question served as the review's aim:

1. What evidence in the literature is there for the impact of publicly funded research in education?

To ensure methodological rigor, we followed the systematic review procedures outlined by Moher et al. [31], which are illustrated diagrammatically in Fig. 1 and include the stages of identification, screening, eligibility, and inclusion. The strategic search terms used in this review were "government-funded research education," "government-granted research education," "publicly funded research education," and "publicly granted research education."

2.1 Inclusion and Exclusion Criteria

Studies were included if they (1) investigated the impact of publicly funded research in education in both public and private basic and higher education institutions, as well as in business/organizations; (2) investigated variables and/or phenomena of publicly funded research related to the educational system and delivery; and (3) included at least one type of impact of publicly funded research as used in education. As shown in Table 1, articles employing qualitative, quantitative, and mixed methodologies, as well as meta-analysis, were included, and no research design criteria were used. Studies conducted earlier in 2000, published in languages other than English, not accessible through the Google Scholar search engine, and relevant to strategy creation but not the intended topic were excluded.

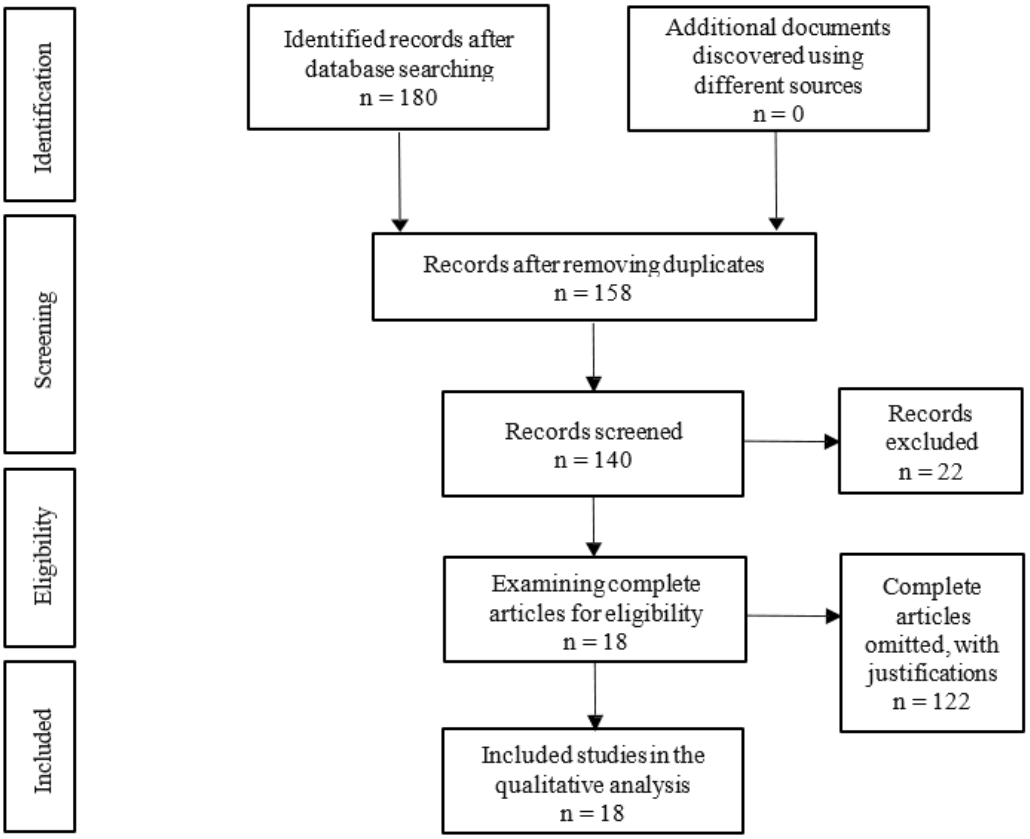

Figure 1. PRISMA Flow Diagram of the Study

Conforming with our definition, publicly funded research in education involves scientific or scholarly investigations supported by public resources, such as government funding or educational institutions, to advance knowledge, inform educational practices, and improve educational outcomes, the following criteria were applied. This means further that studies must be in consonance with the impact of publicly funded research in the educational setting or businesses with emphasis on how organizations or schools have impacted with this.

Table 1. Inclusion and Exclusion Criteria of the Study

Eligibility Criteria	Inclusion	Exclusion
Time Frame/ Years	2000 to 2023	Below 2000
Language	English	Other Languages
Methodology	Quantitative/ Qualitative/ Mixed Methods	
Electronic Databases	Google Scholar	Other Sources/ Inaccessible Studies
Publication Status	Published in Journals/ Books, Unpublished	

2.2 Search Strategy

Google Scholar, an electronic database, was explored through February 2023. The time frame was 2000-2023. To find additional articles, the reference lists of the included studies and pertinent reviews were meticulously searched. After exporting every search to Endnote, duplicate results were eliminated. The researcher independently screened the titles and abstracts, and irrelevant information was removed. Following the retrieval of full-text versions of the selected articles, inclusion and exclusion criteria were applied.

2.3 Data Extraction

The following evidence was gathered from the chosen studies: (a) author, year of publication, country, (b) study design, (c) participant characteristics, (d) study aim, (e) definition,
(f) results and discussion, (g) conclusion, (h) recommendations/implications, and (i) impact of publicly funded research in education. One researcher retrieved pertinent data, which another corroborated. A consensus-building conversation was used to settle disputes. Table 2 lists the papers that were reviewed in relation to the impact of publicly funded research in education.

Table 2. Reviewed Studies on the Impact of Publicly Funded Research in Education

ID	Author/s, Year	Country	Discipline	Sample Size	Research Focus
[32]	Jaffe (2015)	United States of America	Education	N/A	Developed robust indicators of the impacts.
[33]	Donovan (2019)	United Kingdom	Education	N/A	Investigated the science-society's relationship as well as the responsibilities of publicly supported researchers to do science that is meaningful to society.
[34]	Hickey (2013)	Canada	Education	N/A	Provided an overview of recent trends in publicly funded R & D and forest research around the world.
[35]	Vanino et al. (2019)	United Kingdom	Education	N/A	Focused on the various grant sources, studying the growth of Innovate UK's funding strategy.
[36]	Carr et al. (2015)	Canada	Education	N/A	Provided the first empirical evaluation of the local economic effect of publicly funded research expenditures in the Canada from 2000 to 2009.
[37]	Kimbrough & Gasaway (2016)	United States of America	Education	N/A	Designated public access to government-funded research as a critical issue for researchers, libraries, and ordinary citizens worldwide.
[38]	Czarnitzki & Fier (2003)	Germany	Education	N/A	Examined the development and the impact of publicly funded R & D consortia in Germany.
[39]	Li et al. (2020)	United States of America	Education	N/A	Aimed to learn about research and trends in education based on the publicly funded projects in STEM education as a special lens.
[40]	Reid (2018)	United Kingdom	Education	N/A	Focused on the enactment by the Welsh Government of the Hazelkorn recommendation to undertake an independent review of government-funded research and innovation in Wales.
[41]	Bozeman & Youtie (2017)	United States of America	Education	N/A	Presented case studies of four NSF programs to illustrate social impact efforts and identify gaps in assessing research's socioeconomic effects.
[42]	Brant and Sibanda (2018)	South Africa	Education	N/A	Presented an overview of enabling frameworks for the protection and commercialization of publicly funded R&D outcomes
[43]	Salter et al. (2000)	United Kingdom	Education	N/A	Focused to publicly funded research and the necessity to strengthen it if the United Kingdom is to remain a world leader in innovation in the twenty-first century.
[44]	Martin (2007)	United Kingdom	Education	N/A	Addressed the economic and social benefits that flow from public support of basic research
[45]	Salter & Martin	United	Education	N/A	Analyzed the literature on publicly funded basic

	(2000)	Kingdom			research economic benefits.
[46]	Coryn (2008)	United States of America	Education	N/A	Provide an overview of the research assessment processes in sixteen nations in terms of their key reasons and objectives for evaluating government- funded research indicators and criteria
[47]	Gomes & Stavropoulou (2019)	United Kingdom	Education	N/A	Identified, generated, and critically examined empirical proof of the impact of publicly and charitable-funded health research in the United Kingdom.
[48]	Muizniece (2019)	Latvia	Education	N/A	Highlighted that incentives for research commercialization can be affected by a top-down implementation that ignoring the requirements and abilities of universities to leverage them.
[49]	Han et al. (2021)	South Korea	Education	N/A	Demonstrated the organizational characteristics of public R&D organizations influence their performance

2.4 Risk of Bias (Quality) Assessment

A modified approach designed for analyzing mixed-method reviews was utilized. The research design, randomization, blinding, and full outcome data were utilized to assess quantitative experimental investigations. The appropriateness of sample, justification of metrics utilized, and management of confounding variables were used to assess observational studies. The goal of the study, the soundness of the design or procedure, the reason for sampling, the description of the participants, data collection and analysis, and the discussion of the researchers' reflexivity were all taken into account. The risk of bias in each individual study was gathered, reviewed by one researcher, and then argued by another member if there were any discrepancies in the assessment.

2.5 Data Analysis

Starting with the final listing of the literatures, demographic data was collected in terms of study year, nation, and research focus/topic area. To collect data on the influence of publicly funded research in education, thematic analysis was performed, which emphasized the various components that created the themes for the impact of publicly funded research in education.

3. RESULTS AND DISCUSSION

The 18 examined articles were from the following countries: Canada (2), Germany (1), Latvia (1), South Africa (1), South Korea (1), the United Kingdom (7), and the United States of America (5) (see Table 3). There were 17 studies (94.4%) focusing on higher education, whereas no studies (0%) were found in basic education. Furthermore, because they are systematic literature reviews and books, one study (5.6%) was not identified.

Table 3. Distribution of the Reviewed Studies by Country and by Educational Level

Place of Publication/Study	Educational Level			Total
	Basic Education	Higher Education	Not Identified	
Canada		2		2
Germany		1		1
Latvia		1		1
South Africa		1		1
South Korea		1		1
United Kingdom		6	1	7
United States of America		5		5
Total		17	1	18

3.1 Impact of Publicly Funded Research in Education

Based on the reviewed 18 articles, the impact of publicly funded research in education is communicated in two themes which are Translating Knowledge and Research Impact and Prioritizing Funding and Research (see Table 4).

Translating Knowledge and Research Impact. This theme has created four constructs: *Student Achievement, Professional Development, Use of Educational Technologies and Innovations, Research-Practice Partnership, Stakeholders' Engagement, and Economic Impact of Research Initiatives.*

Student Achievement is strongly interpreted as one of the most direct outcomes of publicly funded research in education. The findings suggest that research engagement enhances students' academic performance, critical thinking, and practical competencies by exposing them to inquiry-based and industry-linked learning environments. Compared with previous studies, Jaffe [32] similarly emphasized that public research creates social effects by increasing knowledge acquisition and sustained interest in specific fields, while Salter and Martin [45] further support that exposure to research environments produces skilled graduates who are more adaptable to labor market demands. In terms of contribution to education, this demonstrates that research funding strengthens the bridge between theory and practice, allowing students to gain experiential learning opportunities that traditional classroom instruction may not provide. From a policy perspective, this highlights the need for governments and institutions to integrate research-based learning into curricula and to support programs that connect students directly with research activities and industry applications.

Professional Development is interpreted as a critical institutional outcome of publicly funded research, as it strengthens the capabilities of academic staff and research personnel. The findings indicate that research funding improves staff competencies, research productivity, and institutional research culture through continuous skill enhancement and knowledge exchange. Gomes and Stavropoulou [47] similarly found that research utilization improves staff development and overall research capacity, while Muizniece [48] highlights that increased R&D workforce capability directly enhances performance outcomes. Compared with these studies, the current synthesis emphasizes not only individual capacity building but also institutional transformation. In terms of contribution to education, professional development ensures that educators are better equipped to deliver updated content and engage in evidence-based teaching. Policy implications suggest that funding agencies should prioritize sustained investment in academic training, research capacity-building programs, and institutional support systems that foster long-term professional growth.

The *Use of Educational Technologies and Innovations* is interpreted as a central mechanism through which publicly funded research modernizes education systems. The findings show that research outputs contribute to the development of digital tools, educational software, and innovative teaching approaches that improve learning delivery. Czarnitzki and Fier [38] and national innovation system perspectives [34] similarly stress that research funding drives technological advancement and knowledge transfer within education systems. Compared to earlier studies, this review emphasizes that innovation is not only a product of research but also a continuous process embedded in teaching and learning environments. The contribution to education is evident in the enhancement of instructional quality, accessibility of learning resources, and diversification of pedagogical methods. From a policy standpoint, governments should strengthen digital infrastructure investment and encourage the integration of research-based innovations into formal education systems to ensure sustained technological advancement.

Research-Practice Partnership is interpreted as an essential bridge that connects academic research with real-world application. The findings indicate that collaboration between universities, industries, and research institutions enhances the relevance and applicability of research outputs. Czarnitzki and Fier [38] support this by emphasizing the importance of structured collaboration networks, while Muizniece [48] highlights the role of funding agencies in fostering institutional partnerships and transformation. Compared to these studies, the current analysis underscores that partnerships are most effective when they are continuous and embedded within institutional frameworks rather than being project-based. The contribution to education lies in ensuring that curricula, teaching practices, and research agendas remain aligned with industry and societal needs. Policy implications include strengthening consortium-based funding models and incentivizing long-term university–industry collaboration to maximize research impact.

Stakeholders' Engagement is interpreted as a key factor in amplifying the societal relevance of publicly funded research. The findings reveal that open access to research outputs and active dissemination increase participation from students, educators, policymakers, and the general public. Salter et al. [43] similarly note that expanded stakeholder involvement enhances knowledge-driven systems, while Czarnitzki and Fier [38] emphasize the role of open dissemination in strengthening public understanding of science. Compared with these studies, this synthesis highlights that engagement is not only informational but also participatory, where stakeholders actively contribute to shaping research directions. In terms of educational contribution, stakeholder engagement promotes transparency, collaboration, and shared ownership of knowledge. Policy implications point to the importance of open-access mandates, public engagement frameworks, and inclusive research dissemination strategies.

Finally, the *Economic Impact of Research Initiatives* is interpreted as a significant macro-level outcome of publicly funded research in education. The findings demonstrate that research contributes to economic growth through innovation, job creation, and the development of skilled graduates. Donovan [33] and Carr et al. [36] similarly highlight the tangible economic returns of research investments, while Martin and Tang [44] emphasize

that government-funded research contributes to both knowledge production and workforce development. Compared to these studies, the current synthesis reinforces the idea that education is a central channel through which economic benefits are realized, particularly through graduate employability and knowledge transfer. The contribution to education is reflected in the production of highly skilled graduates capable of addressing complex societal and industrial challenges. Policy implications suggest that sustained public investment in research is essential, not only for academic advancement but also for national economic competitiveness and innovation-driven development.

Prioritizing Funding and Research. This theme has two constructs: *Research Competition* and *Funding and Resource Allocation*. The findings indicate that prioritizing funding and research is increasingly shaped by intensifying competition for government research funds and evolving mechanisms of resource allocation. In many national systems, particularly those operating under performance-based financing, research institutions are required to compete for limited public funding, which influences both the quality and direction of research activities. These findings are consistent with the work of Matveeva [50], who emphasize that competitive research funding systems have become a dominant feature of modern higher education governance, as well as van der Pol [51], who highlight that increased competition in research funding can stimulate innovation and productivity in academic institutions.

Research competition is interpreted as a driving force that encourages institutions to improve research quality, productivity, and relevance. However, it also creates structural pressure, especially in contexts where funding availability is constrained. The findings suggest that improvement in research outputs often emerges as a consequence of national-level evaluation systems, where institutions are continuously assessed based on performance indicators [46]. This aligns with Ortagus et al. [52], who explains that performance-based research evaluation systems significantly shape institutional behavior through bibliometric and output-driven assessments. Similarly, Mitterle and Bloch [53] describe this phenomenon as part of the broader "academic capitalism" trend, where institutions increasingly compete for external resources in market-like conditions.

In terms of *Funding and Resource Allocation*, the findings show that government agencies play a central role in shaping research priorities. Funding approval is not only financial support but also a validation of a project's relevance and alignment with national development goals. This indicates that funding structures directly influence the direction of educational and research agendas, making resource allocation a strategic policy tool rather than a purely administrative process. According to Edler and Fagerberg [54], research funding policies are increasingly used by governments as strategic instruments to steer national innovation and education priorities. This has direct implications for education, as funding priorities influence institutional capacity building, knowledge production, and the development of evidence-based educational practices. In terms of policy implications, the findings suggest the need for transparent and equitable funding mechanisms to reduce disparities between institutions while maintaining incentives for research excellence [55].

Table 4. Themes on the Impact of Publicly Funded Research in Education

Themes on the Impact Publicly Funded Research in Education	Characteristics	Study ID	Number of Studies
Translating Knowledge and Research Impact	Student Achievement	[32] [43]	2
	Professional Development	[42] [47] [49]	3
	Use of Educational Technologies and Innovations	[34] [38] [45]	3
	Research-Practice Partnership	[38] [48]	2
	Stakeholders' Engagement	[37] [43]	2
	Economic Impact of Research Initiatives	[33] [36] [44] [45]	4
Prioritizing Funding and Research	Research Competition	[46] [49]	2
	Funding and Resource Allocation	[39] [41]	2

The findings of this study have important implications for policymakers, educational leaders, and researchers. They highlight the need to strengthen mechanisms that enhance the translation of research findings into classroom practice and policy implementation. Furthermore, the study underscores the importance of aligning funding priorities with measurable educational outcomes to ensure efficient use of public resources. It also emphasizes the role of publicly funded research in promoting continuous improvement, innovation, and accountability within education systems.

Future studies may explore the long-term effects of publicly funded educational research through longitudinal designs that examine outcomes such as student achievement, employability, and well-being. In addition, research is needed to evaluate the cost-effectiveness of publicly funded research initiatives to guide more efficient allocation of resources. Further studies may also examine diverse theoretical perspectives on

research impact and educational evaluation, particularly in post-pandemic contexts, to better understand how research influences evolving educational systems and practices.

4. CONCLUSION

This study systematically reviewed literature on the impact of publicly funded research in education using a systematic review approach guided by the PRISMA framework. The analysis identified two key themes: translating knowledge and research impact and prioritizing funding and research. The findings indicate that publicly funded educational research plays a crucial role in supporting evidence-based decision-making, improving educational practices, strengthening policy development, and promoting professional growth among educators. Overall, it ensures that educational reforms and practices are grounded in empirical evidence rather than assumptions or anecdotal judgments.

ACKNOWLEDGEMENTS

The author acknowledges with appreciation the guidance and support provided by family and friends throughout this study

REFERENCES

[1] N. Shockey, "Taxpayers to get immediate access to publicly funded research," *SPARC*, Aug. 25, 2022.
[2] D. Mendrinos, S. Karytsas, O. Polyzou, C. Karytsas, Å. D. Nordø, K. Midttømme, *et al.*, "Understanding societal requirements of CCS projects: Application of the societal embeddedness level assessment methodology in four national case studies," *Clean Technologies*, vol. 4, no. 4, pp. 893–907, 2022, doi: 10.3390/cleantechnol4040055.
[3] L. Fleming, H. Greene, G. Li, M. Marx, and D. Yao, "Government-funded research increasingly fuels innovation," *Science*, vol. 364, no. 6446, pp. 1139–1141, 2019, doi: 10.1126/science.aaw2373.
[4] D. B. Audretsch, A. N. Link, and J. T. Scott, "Public/private technology partnerships: Evaluating SBIR-supported research," in *The Social Value of New Technology*. Cheltenham, UK: Edward Elgar, 2019, pp. 264–278, doi: 10.4337/9781788116336.00021.
[5] P. Repette, J. Sabatini-Marques, T. Yigitcanlar, D. Sell, and E. Costa, "The evolution of city-as-a-platform: Smart urban development governance with collective knowledge-based platform urbanism," *Land*, vol. 10, no. 1, p. 33, 2021, doi: 10.3390/land10010033.
[6] National Research Council, *Knowing What Students Know*. Washington, DC, USA: Natl. Acad. Press, 2001.
[7] A. S. Munna and M. A. Kalam, "Teaching effectiveness," *Int. J. Humanit. Innov.*, vol. 4, no. 1, pp. 1–4, 2021.
[8] X. Li and L. Da Xu, "Internet of Things resource allocation," *IEEE Internet Things J.*, vol. 8, no. 11, pp. 8657–8666, 2020, doi: 10.1109/JIOT.2020.3035542.
[9] C. J. Solone, B. E. Thornton, J. C. Chiappe, C. Perez, M. K. Rearick, and M. A. Falvey, "Creating collaborative schools in the United States: A review of best practices," *International Electronic Journal of Elementary Education*, vol. 12, no. 3, pp. 283–292, 2020, doi: 10.26822/iejee.2020358222.
[10] P. Guo, N. Saab, L. S. Post, and W. Admiraal, "Project-based learning in higher education," *Int. J. Educ. Res.*, vol. 102, art. no. 101586, 2020, doi: 10.1016/j.ijer.2020.101586.
[11] L. Harper, N. Kalfa, G. M. A. Beckers, M. Kaefer, A. J. Nieuwhof-Leppink, M. Fossum, *et al.*, "The impact of COVID-19 on research," *Journal of Pediatric Urology*, vol. 16, no. 5, p. 715, 2020, doi: 10.1016/j.jpurol.2020.07.002.
[12] O. N. Jacob, "Impact of COVID-19 school closures on research programmes," *Int. J. Adv. Data Inf. Syst.*, vol. 1, no. 1, pp. 40–49, 2020, doi: 10.25008/ijadis.v1i1.189.
[13] R. Maguire, S. Hynes, B. Seebacher, V. J. Block, K. M. Zackowski, J. Jonsdottir, *et al.*, "Research interrupted: The impact of the COVID-19 pandemic on multiple sclerosis research in the field of rehabilitation and quality of life," *Multiple Sclerosis Journal—Experimental, Translational and Clinical*, vol. 7, no. 3, p. 20552173211038030, 2021, doi: 10.1177/20552173211038030.
[14] O. P. Mehta, P. Bhandari, A. Raut, S. E. O. Kacimi, and N. T. Huy, "Coronavirus disease (COVID-19): comprehensive review of clinical presentation," *Frontiers in Public Health*, vol. 8, p. 582932, 2021. doi: 10.3389/fpubh.2020.582932.
[15] F. Schwendinger and E. Pocecco, "Physical inactivity during COVID-19," *Int. J. Environ. Res. Public Health*, vol. 17, no. 11, art. no. 3909, 2020, doi: 10.3390/ijerph17113909.
[16] C. V. Fry, X. Cai, Y. Zhang, and C. S. Wagner, "Consolidation in a crisis: Patterns of international collaboration in early COVID-19 research," *PLOS ONE*, vol. 15, no. 7, p. e0236307, 2020, doi: 10.1371/journal.pone.0236307.
[17] C. Sohrabi, G. Mathew, T. Franchi, A. Kerwan, M. Griffin, J. S. C. Del Mundo, *et al.*, "Impact of the coronavirus (COVID-19) pandemic on scientific research and implications for clinical academic training—a review," *International Journal of Surgery*, vol. 86, pp. 57–63, 2021, doi: 10.1111/j.1460-9568.2006.05116.x.
[18] V. Moorthy, A. M. H. Restrepo, M. P. Preziosi, and S. Swaminathan, "Data sharing for novel coronavirus (COVID-19)," *Bulletin of the World Health Organization*, vol. 98, no. 3, p. 150, 2020, doi: 10.2471/BLT.20.251561.
[19] C. Rutz, M. C. Loretto, A. E. Bates, S. C. Davidson, C. M. Duarte, W. Jetz, *et al.*, "COVID-19 lockdown allows researchers to quantify the effects of human activity on wildlife," *Nature Ecology & Evolution*, vol. 4, no. 9, pp. 1156–1159, 2020, doi: 10.1038/s41559-020-1237-z.
[20] T. May and B. Perry, *Social Research: Issues, Methods and Process*. McGraw-Hill Education, UK, 2022.
[21] H. Iglič, P. Doreian, L. Kronegger, and A. Ferligoj, "With whom do researchers collaborate and why?," *Scientometrics*, vol. 112, pp. 153–174, 2017, doi: 10.1007/s11192-017-2386-y.

[22] E. Esho and G. Verhoef, *The funding gap and the financing of small and medium businesses: An integrated literature review and an agenda*, 2018.
[23] V. Piterska, O. Lohinov, and L. Lohinova, "Mechanism for forming an effective portfolio of research projects of institution of higher education," *Innovative Technologies and Scientific Solutions for Industries*, vol. 3, no. 9, pp. 99–108, 2019, doi: 10.30837/2522-9818.2019.9.099.
[24] K. Holloway and M. Herder, "A responsibility to commercialize? Tracing academic researchers' evolving engagement with the commercialization of biomedical research," *Journal of Responsible Innovation*, vol. 6, no. 3, pp. 263–283, 2019, doi: 10.1080/23299460.2019.1608615.
[25] A. Tham, M. Raciti, and J. Dale, "Widening participation between 2001 and 2021: A systematic literature review and research agenda," *Journal of University Teaching and Learning Practice*, vol. 20, no. 6, pp. 1–27, 2023.
[26] M. Dawson, A. Maricut-Akbik, and A. Bobić, "Reconciling independence and accountability at the European Central Bank: The false promise of proceduralism," *European Law Journal*, vol. 25, no. 1, pp. 75–93, 2019, doi: 10.1111/eulj.12305.
[27] A. Gardner, A. L. Smith, A. Steventon, E. Coughlan, and M. Oldfield, "Ethical funding for trustworthy AI: Proposals to address the responsibilities of funders to ensure that projects adhere to trustworthy AI practice," *AI and Ethics*, pp. 1–15, 2022, doi: 10.1007/s43681-021-00069-w.
[28] S. Cruz Rivera, D. G. Kyte, O. L. Aiyegbusi, T. J. Keeley, and M. J. Calvert, "Assessing the impact of healthcare research: a systematic review of methodological frameworks," *PLoS Medicine*, vol. 14, no. 8, p. e1002370, 2017, doi: 10.1371/journal.pmed.1002370.
[29] A. G. Gibson and E. Hazelkorn, "Arts and humanities research, redefining public benefit, and research prioritization in Ireland," *Research Evaluation*, vol. 26, no. 3, pp. 199–210, 2017, doi: 10.1093/reseval/rvx012.
[30] M. J. Page and D. Moher, "Evaluations of the uptake and impact of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement and extensions: A scoping review," *Systematic Reviews*, vol. 6, no. 1, pp. 1–14, 2017, doi: 10.1186/s13643-017-0663-8.
[31] D. Moher, A. Liberati, J. Tetzlaff, and D. G. Altman, "Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement," *BMJ*, vol. 339, 2009, doi: 10.1136/bmj.b2535.
[32] A. B. Jaffe, *A framework for evaluating the beneficial impacts of publicly funded research*. Motu, 2015.
[33] C. Donovan, "Assessing the broader impacts of publicly funded research," in *Handbook on Science and Public Policy*, pp. 488–501, Edward Elgar Publishing, 2019, doi: 10.4337/9781784715946.00036.
[34] G. M. Hickey, "International developments in the administration of publicly-funded forest research: A review," *Forest Policy and Economics*, vol. 37, pp. 1–8, 2013, doi: 10.1016/j.forpol.2013.08.003.
[35] E. Vanino, S. Roper, and B. Becker, "Knowledge to money: Assessing the business performance effects of publicly-funded R&D grants," *Research Policy*, vol. 48, no. 7, pp. 1714–1737, 2019, doi: 10.1016/j.respol.2019.04.001.
[36] K. Carr, D. C. Natcher, and R. Olfert, "Measuring the economic impact of publicly funded research in Northern Canada," *Polar Geography*, vol. 36, no. 4, pp. 291–304, 2013, doi: 10.1080/1088937X.2013.826746.
[37] J. L. Kimbrough and L. N. Gasaway, "Publication of government-funded research, open access, and the public interest," *Vanderbilt Journal of Entertainment & Technology Law*, vol. 18, pp. 267, 2015.
[38] D. Czarnitzki and A. Fier, "Publicly funded R&D collaborations and patent outcome in Germany," *ZEW Discussion Papers*, no. 03-24, 2003.
[39] Y. Li, K. Wang, Y. Xiao, J. E. Froyd, and S. B. Nite, "Research and trends in STEM education: A systematic analysis of publicly funded projects," *International Journal of STEM Education*, vol. 7, no. 1, pp. 1–17, 2020, doi: 10.1186/s40594-020-00213-8.
[40] G. Reid, *Review of government funded research and innovation in Wales*, Welsh Government, 2018.
[41] B. Bozeman and J. Youtie, "Socio-economic impacts and public value of government-funded research: Lessons from four US National Science Foundation initiatives," *Research Policy*, vol. 46, no. 8, pp. 1387–1398, 2017, doi: 10.1016/j.respol.2017.06.003.
[42] J. Brant and M. Sibanda, *South Africa: IP Management and the Commercialization of Publicly Funded Research Outcomes*, WIPO, Geneva, pp. 24–26, 2018.
[43] A. Salter, P. D'Este, B. Martin, A. Geuna, A. Scott, K. Pavitt, … P. Nightingale, *Talent, not technology: Publicly funded research and innovation in the UK*, London: CVCP, 2000.
[44] B. R. Martin and P. Tang, *The benefits from publicly funded research*, Science Policy Research Unit, University of Sussex, 2007.
[45] A. J. Salter and B. R. Martin, "The economic benefits of publicly funded basic research: A critical review," *Research Policy*, vol. 30, no. 3, pp. 509–532, 2001, doi: 10.1016/S0048-7333(00)00091-3.
[46] C. L. Coryn, "The fundamental characteristics of international models and mechanisms for evaluating government-funded research," *ACCESS: Critical Perspectives on Communication, Cultural & Policy Studies*, vol. 27, no. 1/2, pp. 9–25, 2008, doi: 10.3316/informit.736350111710175.
[47] D. Gomes and C. Stavropoulou, "Impact of publicly and charity-funded research in the UK," *Health Res. Policy Syst.*, vol. 17, no. 1, pp. 1–11, 2019, doi: 10.1186/s12961-019-0425-2.
[48] L. Muizniece, "University autonomy and commercialization of publicly funded research: The case of Latvia," *Journal of the Knowledge Economy*, vol. 12, pp. 1494–1516, 2021, doi: 10.1007/s13132-020-00681-x.
[49] S. Han, S. K. Park, and K. T. Kwak, "Workforce Composition of Public R&D and Performance: Evidence from Korean Government-Funded Research Institutes," *Sustainability*, vol. 13, no. 7, p. 3789, 2021, doi: 10.3390/su13073789.
[50] A. Matveeva, "Performance-based funding in higher education: A meta-narrative review and renewed research agenda proposal," *Tertiary Education and Management*, vol. 31, pp. 21–44, 2025, doi: 10.1007/s11233-025-09151-y.
[51] J. van der Pol, "The impact of funding on the 5G innovation ecosystem," *Scientometrics*, vol. 129, pp. 2037–2056, 2024, doi: 10.1007/s11192-024-04954-z.

[52] J. C. Ortagus, R. Kelchen, K. Rosinger, and N. Voorhees, "Performance-based funding in American higher education: A systematic synthesis of the intended and unintended consequences," *Educational Evaluation and Policy Analysis*, vol. 42, no. 4, pp. 520–550, 2020, doi: 10.3102/0162373720953128.
[53] A. Mitterle and R. Bloch, "Beyond markets: On field competition in higher education," *Studies in Higher Education*, vol. 49, no. 11, pp. 1720–1732, 2024, doi: 10.1080/03075079.2024.2399724.
[54] J. Edler and J. Fagerberg, "Innovation policy: what, why, and how," *Oxford Review of Economic Policy*, vol. 37, no. 1, pp. 2–23, 2021, doi: 10.1093/oxrep/graa029.
[55] A. E. Lee, K. G. Salazar, and G. Rhoades, "Embedded classed and raced academic capitalism in an innovative 'solution' to college costs: Income share agreements at two public AAU research universities," *The Review of Higher Education*, vol. 48, no. 1, pp. 61–95, 2024, doi: 10.1353/rhe.2024.a937144.