A snapshot of educational research in 2020: Where is the Rod of Asclepius for Education?

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Abstract: Without a doubt, 2020 is a peculiar year. The Coronavirus 2019 (COVID-19) pandemic has caused people breakdown, school closure, city lockdown, healthcare systems scrambled. There is a global disruption in the education sector, and it seems like the education systems worldwide have to enforce educational reforms regardless of whether they have prepared. Many schools have to implement what they have planned for years within a few weeks due to the disease. Although this leads to uncountable and unimaginable challenges, one can still grab the opportunity to thrive, try new teaching and learning methods, and new ways of communication or new looks into educational institutions. Even though the pandemic is far from over and we were not yet able to find out the proper medical plan to secure our humanity from the “positive for COVID-19”, there are positive signals that we can find the Rod of Asclepius for educational concerns. As Gandhi said: “Adversity is the mother of progress”, we can see the quote imprinted in reality with amazing inventions from students, teachers, educators and valuable publications from scholars around the world, targeting a new normal state and probably a new future.

Keywords: Education, Education Research, Bibliometric, COVID-19, school closure, education reform

An overview of scholarly works on education in 2020

We searched data from Clarivate Web of Science (WOS) with titles containing the keyword “school” and the topic is “education”. By 20 Dec 2020, the initial result of 4802 articles in English has been reduced to 2354 documents, as we included only 11 categories related to education.

Figure 1: Co-occurrence network of all keywords in education publications.

Figure 1 illustrates the co-occurrence network of 134 keywords, using the threshold of 20 occurrences, regarding the larger pool of 8512 keywords. Besides the search keyword “education”, most studied keywords include “students”, “children”, “achievement”, “engagement”, “teachers”, “impact”, “policy” and “perceptions”. It is clear that “teachers” still attracts much attention in research this year, with familiar subtopics such as “professional development”, “curriculum”, “technology”, “beliefs” and “pedagogy”. Moreover, “teachers” is the bridge to connect and lead to three leading “schools of thought” in 2020 education literature.

The most prominent theme is *students’ perceptions, academic achievement and performance*. There are many antecedents for those outcomes. The first group is related to family, with parental involvement in children’s learning and socio-economic status (SES). In particular, research focuses on (i) the impact of parental involvement and socio-economics status on academic

achievement and students' learning behaviours (Otani, 2020; Thomas et al., 2020; Lamare & Myrthong, 2020); (ii) perceptions of students, parents and teachers on parental involvement (Anastasiou & Papagianni, 2020; Jabar, 2020) and (iii) parental involvement within school policy (Yulianti et al., 2020; Zenda, 2020; Dodillet & Christensen, 2020). Regarding the turbulent situation of education systems under the chaotic circumstance of COVID-19 (Tran et al., 2020), those efforts' contributions are more crucial, as a praxis to tackle both foreseen and unprecedented education challenges.

The second group includes stress, health, mental health, and transition (when students move from primary to secondary school, for instance). An interesting study is of Kurasawa et al. (2020), which finds the effect of sleep education for students from grades one to six in Japan. They show that therapists' sleep education does not affect lower grade students but can reduce excessive daytime sleepiness in upper-grade students. Another vital research aspect is students' transition stage as students' academic achievement (Kiuru et al., 2020), behaviours (Boone & Demanet, 2020), and emotion (Mahmud, 2020) are more volatile in this period. The school-to-work transition is noticeable among the literature. Huegaerts et al. (2019) prove the relationship between the type of school-to-work transition and mental health when students enter the labour market. Vu et al. (2020) and Hoang (2020) also tackled teachers' mental health concerns during COVID-19.

The final group contains factors such as motivation, efficacy, self-determination, and resilience – the main subjects for this research path range from preschool students to adolescents and youth. However, within “efficacy” subtopics, many scholars choose to dig deeper into teachers' problems. In particular, Choi and Lee (2020) investigate ways to improve teachers' self-efficacy in the multicultural learning environment. On the other approach, Zhou et al. (2020) focus on specific high school teachers' self-efficacy in teaching Computer Science. In addition, both teachers and students' motivation are also well studied, with its connection to academic achievement (Xie et al., 2020; Islam & Chakrabarty, 2020) and efficacy (Girgin, 2020; Hsieh, 2020). Research in subtopics of “self-determination” and “resilience” are more limited, concentrating on self-determination theory (Kong & Liu, 2020; Knopik & Oszwa, 2020) and resilience at the organisational level (Drossel et al., 2020; Morote et al., 2020).

The second school of thought is *education reform and educational policy*. These policies aim for an equity and quality education system, through studying about race/segregation (Benson, 2020),

poverty, social justice (Heimans & Singh, 2020) and inclusive education (Azorín & Ainscow, 2020). In the study about successful principals in high-poverty schools, De Lisle and his colleagues point out three meanings for successful leadership: “integrative, transformational and enabling, and academic-focused” (De Lisle et al., 2020). They are consistent with three leadership models (shared, transformational, and instructional leadership), and are crucial for school improvement in Trinidad and Tobago (De Lisle et al., 2020). Beside school leadership, educational policies are typically associated with school accountability, school autonomy and politics. Johnson Ross and Parkes (2020) report the understandings about school-related gender-based violence (SRGBV) of policy stakeholders in Ethiopia and Zambia. The results can help form more effective political processes to enact the policy and reduce SRGBV (Johnson Ross & Parkes, 2020).

Finally, the topic of *gender* is also well studied by researchers this year. Gender difference is manifested through identity, culture, skills and literacy. Math, STEM, and Science in secondary school students and higher education students are popular researched subjects. From the map, we can see that gender is the moderator variable for the relationship between academic achievement and other variables. For example, Ranjeeth et al. (2020) study the relationship between academic performance and nine parameters (parents’ education, time spent on learning), with comparative analysis of boys and girls. Another research finds the effect of early education programs on school outcomes (Muschkin et al., 2020), in which male students experience more considerable program-related gain than their female counterparts.

Research on the contemporary educational reform due to the COVID-19 pandemic

A remarkable thing about the Coronavirus is that it creates more special issues in various journals, and it promotes numerous publications that would not be here without its trigger. On Google Scholar, a search query of “COVID” and “education” in 2020 produces nearly 77,000 documents, and this number from WOS is 321 articles. Using the four occurrences threshold, Figure 2 presents the co-occurrence network of 68 keywords in education publications related to COVID-19, among the total of 1098 keywords.

Three remarkable subtopics can be identified. The first subtopic is *the form of learning*, with keywords “blended learning”, “distance learning”, “e-learning”, “online education”, “online teaching”, “remote teaching” and “social media”. During the COVID-19 period, teachers and

educators worldwide continuously explore and share teaching online tools and tips. The challenges they have to face when using those tools are reported in various publications, from internet quality to course design and administrative support (Al-Balas et al., 2020; Sankar et al., 2020). Meanwhile, diverse responses and solutions from governments and educational institutions are also discussed (La et al., 2020; Pham & Ho, 2020; Dube, 2020).

Figure 2: Co-occurrence network of keywords in education publications related to COVID-19.

The second subtopic is about *educational concerns* during COVID-19 period. Specifically, teachers and students' perspectives attract much attention, as they can modify and improve

teaching methods, curriculum design and educational policies (Van Doren et al., 2020; Schlenz et al., 2020). Some other crucial keywords are “engagement”, “impact”, “outcomes”, “management”, “perceptions”, “performance”, and “satisfaction”. The Coronavirus has unimaginable impacts on different sides of education systems, ranging from students’ performance, teachers’ satisfaction to school management; and different education levels (from early childhood to higher education).

The third and final subtopic focuses on *medical education*. The noticeable keywords are: “public health”, “COVID-19”, “SARS-COV-2”, “surgical education”, “telehealth”, “telemedicine”, and “simulation”. More than ever, the healthcare sector's role is undoubtedly the most vital for humankind, which brings about the significant responsibilities of medical education during this period. The disease causes many difficulties for medical education, especially for the lecturers, since they have to deliver lectures safely and ensure the quality of learning at the same time (Alsoufi et al., 2020). Furthermore, there are challenges related to technology, consultation, collaboration, assessment and educational environment (Torda, 2020). Many students report a lack of learning interest, lack of face-to-face interaction, and the study is not compelling (Aziz et al., 2020). Whilst, teachers, have problems with teaching skills, teaching methods, teaching disciplines, and self-efficacy (Aziz et al., 2020). They said that *“It is very difficult to teach anatomy online. Students want to feel and hold structures/ bones in their own hands”*. This is a typical problem that happens exclusively with medical education and other vocational training. Generally, most of the publications studied the challenges and changes during the pandemic; the remaining are some documents suggesting solutions to overcome this arduous period. Sani and co-authors (2020) propose “group-based interprofessional education (IPE)”, or “virtual consultations with simulated patients”, besides other pedagogical tools and technology integration (Grzych & Schraen-Maschke, 2020; Naidoo et al., 2020).

Conclusion

The purpose of this work is to provide a holistic portrait of educational research in 2020 in a lean and novel approach. We adopted bibliometric analyses to highlight the urgent research focus of 2020, in which the propensity of research focus is quite different in comparison with 2019. During 2019, educational researchers focused on traditional education issues such as equality and equity, social-emotional learning (SEL), student-centred or teacher-centred (Hoang, 2019). Within 2020, as identified and interpreted within the manuscript, regarding education reform during COVID-

19, educational researchers' primary concerns are: (i) new models of learning; (ii) educational concerns, and (iii) medical concerns. In particular, the prominent spotlights of the year are (i) students' perceptions, academic achievement and performance, and (ii) education reform and educational policy. Besides, this paper also visualised the linkages between those research focuses to form an outline for further studies. Indeed, every work contains mistakes (Vuong, 2020). As our work has been conducted during the last days of 2020, our dataset does not include publications published after 01 Dec 2020, or publications that will be indexed in the WOS database after 20 Dec 2020. Therefore, we suggest colleagues follow this pipeline and update the findings after having WOS' full record of 2020 in May 2021. We hope that this work's concise findings might help to serve as a starting conversation for the new year of 2021, especially for researchers who want to re-think about the research focus, efficiency, and effectiveness of educational research during this adversity situation.

Acknowledgements

As the COVID-19 is causing unprecedented short-term and long-term impacts over the globe, we first want to present a marvellous acknowledgment to all doctors, nurses, police, volunteers and citizens regardless of nationality who are fighting against COVID-19. Second, the authors would like to say thanks to all teachers, school leaders and parents who dedicated to sustaining our education systems worldwide.

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