Faisal Bin Badar, PhD Student, Charles Darwin University
Faisal Bin Badar, PhD Student, Charles Darwin University (corresponding author)
faisal.badar@students.cdu.edu.au
(+61) 416 540 270
College of Education, Charles Darwin University,
Ellengowan, Dr., Casuarina, NT 0810, Australia.
Jon Mason, Senior Lecturer, Charles Darwin University

Numbers are Alarming, Solutions are Scant - Out of School Children in Pakistan

Abstract:

Sustainable Development Goal-4 (SDG-4) aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. It further demands direct and continued focus on, and engagement with Out-of-School Children (OOSC) particularly from underprivileged communities, as children from the poorest households are up to four times more likely to be out-of-school. There is a serious lack of basic educational resources for these deprived children, let alone quality education, and global aims to educate every child are unlikely to be addressed through traditional means. With the current pace of industrial change, nine out of ten children are anticipated to reach their adulthood without needed workplace skills by 2030. If current underprivileged children are to *catch-up* with their counterparts in accessing equitable quality education, 100 years will first pass based on current developments in social justice.

This paper presents a case-study of on-ground socio-economic limitations and practices of families of OOSC living in remote and rural areas in Pakistan. The data is collected through formal interviews with the parents of these children, field visits and informal discussions with these families during the survey process – highlighting the needs, interests and voices of these children. Pakistan has the largest population in the world of out-of-school children, adolescents, and youth of primary and secondary school age, and most of them live below the poverty line in low-socioeconomic rural and remote areas. They are also vulnerable for being left out in traditional demographical calculations as many of these families are not even registered in the national database. In presenting an analysis of candidate solutions, we scrutinise the impact of education technology initiatives and the actual impact of these 'imported solutions' to overcome the problem of OOSC accessing quality education. COVID-19 has magnified the problems we set out to investigate; it also accentuates the need for real-world global test grounds for technology-assisted learning solutions and provides a snapshot of practical efficacy of these education technology platforms for underprivileged children of the world. During this global pandemic, most school-going children from low-socio-economic communities in Pakistan are also now adrift from formal learning because no education technology solution is available for these communities. In proposing a solution, we place an emphasis on mixing an education that is inclusive, innovative and adaptable, suited to their socio-economic, technological and cultural circumstances. This 'solution' combines digital home-schooling and one-room schoolhouses, and in doing so provides for sustainable and continued development.

Key Words: Out-of-school Children, education, COVID-19, sustainability, Pakistan, Education Technology

1. Introduction

Global strategic and technological approaches during the last two decades to reduce the number of Out-of-school Children (OOSC) – such as Education for All (EFA), Millennium Development Goals (MGD), Sustainable Development Goal-4 (SDG-4), One Laptop per Child (OLPC) etc. – have not yielded meaningful outcomes in many low- and middle-income countries. Moreover, while progress has continued in developing Education Technology (EdTech) tools during the last two decades, their impact in educating OOSC in underprivileged circumstances is still questionable. One of the primary reasons for these failures may be the isolated inside-out approach from EdTech developers providing strategic and technological solutions for education to OOSC without adequate knowledge and realisation of their local contexts and challenges. Many of these initiatives were conceived, conceptualised, designed and developed by educational innovators in high-income economies, to be delivered and implemented on OOSC, most of whom belong to the poorest backgrounds with a completely different set of challenges and limitations. For the OOSC families living in underprivileged circumstances, local contexts matter significantly and harnessing the benefits of such strategic and technological initiatives to them very much depends on factors such as their local needs, limiting factors, challenges and priorities. Moreover, there is not just one 'developing world' and the challenges extend beyond simplistic ideas of access to technology.

COVID-19 is the biggest pandemic and global health crisis the world has faced in the last 100 years. It has also created sudden and unprecedented challenges in education where formal learning has been disrupted in up to 194 countries affecting 1.6 billion learners (91.3%, as recorded on 01 April 2020) of total enrolled learners globally.[1] Leading up to this crisis, the world also experienced exponential growth of Educational Technology (EdTech) networks. For high-income countries, many stakeholders are undergoing a *crash course* in online learning. These alternate technology-based learning opportunities are not only providing an 'emergency response' or stop-gap solution during the crisis but also stimulating innovative responses. However, for low- and middle-income countries, the hasty global shift towards online education will further exacerbate inequality in the attainment of education around the world.[2] Therefore, there is a need to re-think ways to ensure adaptable and sustainable approach towards inclusive and equitable quality education and promote lifelong learning opportunities for all children of the world, as aimed in SDG-4.

This paper presents a case-study of on-ground socio-economic limitations and practices of families of OOSC living in remote and rural areas in Pakistan. The data is collected through formal interviews with the parents of these children, field visits and informal discussions with these families during the survey process – highlighting the needs, interests and voices of these children. In reporting on a contextual analysis of interviews with key stakeholders, this paper explores the underpinning factors contributing to a high population of out-of-school children in Pakistan. In proposing a solution, an inclusive, innovative and adaptable, educational solution is proposed, suited to their socio-economic, technological and cultural circumstances. This 'solution' combines digital home-schooling and one-room schoolhouses, and in doing so provides for sustainable and continued development.

---

1. "Education: From disruption to recovery," UNESCO, accessed 31 Aug 2020, https://en.unesco.org/covid19/educationresponse

2. "Spotlight: Quality education for all during Covid-19 crisis," (Report No. #011). Hundred. https://hundred-cdn.s3.amazonaws.com/uploads/report /file/15/hundred_spotlight_covid-19_digital.pdf

2. Sustainability, COVID-19 and Education

The term *sustainability* refers to long-term objectives towards a more sustainable world, and the term *sustainable development* indicates the processes leading to achieve these objectives.[3] Education often plays the role of a rescuer in sustainability discussions, intending to transform individuals as well as society as a whole. Conflicting interests of the two often create polarity, which leads to complicated situations making sustainability in educational goals a difficult target.[4] For Kallis (2018), "Planet earth is our lifeboat. And yet the earth is becoming a planet of the shipwrecked. Those with power loot the earth and seas, leaving the looted to drown without lifeboats. Islands of preposterous wealth are created in the midst of rising seas of destitution, golf courses in a planet of slums. Extreme poverty and inequality, climate and ecosystem disaster, the erosion of politics and democracy – we are heading towards a bleak future".[5]

The COVID-19 pandemic represents a global crisis that has triggered an unprecedented shift in educational practices on a global scale. COVID-19 era has also provided us with an opportunity to rethink and redefine learning to achieve Sustainable Development Goals (SDGs) and reassesses what we learn, where we learn and how we learn. This is an opportunity to redesign learning to develop the knowledge, skills, values and attitudes that enable learners of all ages to make informed decisions and actions on global problems such as the climate crisis, change the ways they think and move towards a sustainable future.

The key question for all educational stakeholders is how to continue providing access to formal learning during this disruption. In the words of UNESCO Director-General Audrey Azoulay, "We are entering uncharted territory and working with countries to find hi-tech, low-tech and no-tech solutions to assure the continuity of learning".[6] Governments have been forced to close schools, colleges and universities for an indefinite period, and learning shifted to home-schooling, sometimes without providing clear directives. The pandemic has hit the world when education systems even in advanced countries were not prepared to adapt digital learning opportunities. The situation in underprivileged areas is even worse, with some education systems almost completely deprived of Education Technology-based (EdTech) learning platforms.

The positive aspect of COVID-19 in an educational context is that it provided a great opportunity for EdTech developers to deliver and test their innovative education solutions. Already, the pandemic has transformed many learning communities into online learning communities, forcing all stakeholders to embrace online learning. Technological innovations in education over the past two decades have already enabled a transformed education landscape.[7] Intelligent Digital Systems can now efficiently adapt the learning experience to suit personal learning preferences, often with better precision than any traditional classroom can. Similarly, virtual laboratories provide an opportunity to practice design, conduct and learn from experiments, rather than just

---

3. "Sustainable Development," UNESCO, accessed 31 Aug 2020, https://en.unesco.org/themes/education-sustainable-development/what-is-esd/sd

4. Wolff, L, "Sustainability Education in Risks and Crises: Lessons from COVID-19," *Sustainability* 12, (2020), https://doi:10.3390/su12125205

5. Giorgos Kallis, *Degrowth* (UK: Agenda Publishing, 2018).

6. UNESCO, "Education: From disruption to recovery."

7. Jon, Mason and Hitendra Pillay, "Opening Digital Learning to Deeper Inquiry," In *The International Handbook of E-learning, 2, Implementation and Case Studies*, ed. Mohammad Ally and Badrul Khan. (New York: Routledge, 2015), 1-10.

learning about them.[8] Such examples, however, are not equally available to learners worldwide. UNESCO has developed a live portal *COVID-19 Education Disruption and Response* to show day-to-day status updates regarding education disruption worldwide in addition to other useful information.[9] The OECD has provided a framework to guide an education response to the pandemic including a 25-point checklist of education response to COVID-19 with 13 priority responses by countries. HundrED (April 2020) published a report captioned *Spotlight: Quality Education for all during COVID-19 crisis* including a repository of hundreds of resource pages, innovations, learning approaches and educational tools created by teachers, organisations and governments for students, parents and teachers to consult for everyday educational activities, ideas, initiatives and platforms.[10] They further surveyed 150 stakeholders in education from 31 countries to understand current responses. The survey takeaways include that (i) 87% respondents were concerned that pandemic will increase educational inequality, (ii) only 6% responded that their education system was highly prepared for the pandemic, and (iii) only 17% of respondents believe that education leaders were learning from other countries' responses.

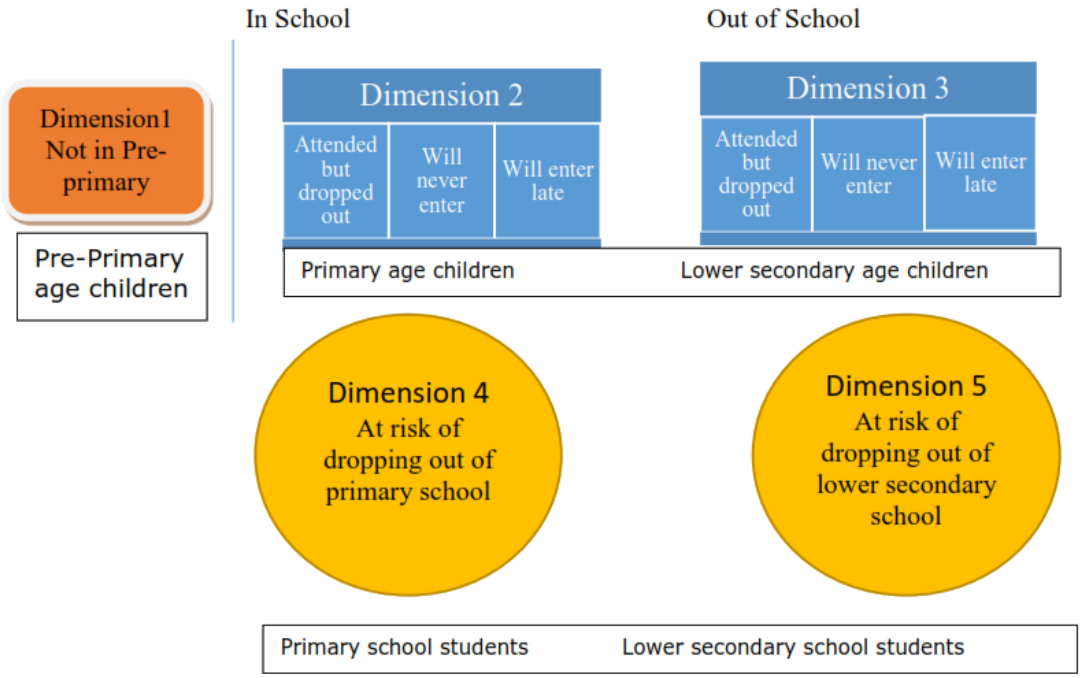
2.1 Global Stakeholders: Efforts and outcomes

Prior to COVID-19, statistics consistently showed one out of every five children, adolescents, and youth globally are out-of-school, or around 263 million children and youth globally.[11] During the last two decades, global education stakeholders have attempted several initiatives to design, develop, and implement numerous educational ideas, methods and technologies, with promising agendas and focus on 21st-century skills to educate out-of-school children (OOSC) around the world such as 'Education for All' (EFA) program by UNESCO in the year 2000, Millennium Development Goals (MGD) by UNDP, UNESCO, UNICEF and the World Bank in the year 2000, and Sustainable Development Goals (SDGs) by UN in the year 2015 to targets world major issues, where SDG-4 aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all children of the world by 2030.[12] However, with less than a decade left from the target deadline, the progress to achieve SDG-4 to ensure inclusive and equitable quality education for all by 2030 is not much encouraging. In 2020, the World Economic Forum [WEF]highlighted that with the current rate of progress, only 32 million out of 263 million children could be educated by 2030. According to UIS, 2019, "Three years after the adoption by Sustainable Development Goal 4 (SDG 4) and the promise to provide universal primary and secondary education, there has been no progress in reducing the global number of out-of-school children, adolescents and youth".[13]

The Five Dimensions of Exclusion (5DE) Model of OOSC as shown in Figure 1, summarises circumstances of millions of children globally who are unable to reach the school doors and

8. Hundred. "Spotlight: Quality education for all during Covid-19 crisis."
9. UNESCO, "Education: From disruption to recovery."
10. Hundred. "Spotlight: Quality education for all during Covid-19 crisis."
11. "263 million children and youth are out of school from primary to upper secondary," UNESCO Institute of Statistics (UIS) Fact Sheet No. 48 (UIS/FS/2018/ED/48), Media Report, Feb, 2018, http://www.unesco.org/new/en/media-services/single-view/news/263_million_children_and_youth_are_out_of_school_from_primar/
12. Faisal Bin Badar, "Extending openness in education support services for out-of-school children in underprivileged circumstances," *Proceedings of the Learning Innovations and Quality (LINQ)*, no. 2, (2019), 18-27.
13. Faisal Bin Badar, "Extending openness in education support services for out-of-school children in underprivileged circumstances," *Proceedings of the Learning Innovations and Quality (LINQ)*, no. 2, (2019), 18-27.

another vast majority who are among those dropouts who do not make it till the end of the school years. Moreover, six out of ten children who remain in the school are still unable to acquire basic literacy and the numeracy taught to them during these school years.[14] Most of these sufferings are from the poorest backgrounds of the world and the worst impact is that these underprivileged children need another 100 years to catch up with their counterparts.[15] The Education Commission has projected that by 2030 more than half of the world's 2 billion children will not be able to acquire their basic secondary level learning skills, and approximately 9 out of 10 children from low-income countries are anticipated to reach their adulthood without the skills they need to progress.[16]



Source: UNICEF & UNESCO UIS, 2011

Figure 1: Five Dimensions of Exclusion (5DE) Model - Dimensions of Out-of-School Children

2.2 Education Technology: Potential and impacts

Technological innovations in education over the past two decades have unprecedently and ineradicably transformed education worldwide. Revolutionary advances in Information and Communications Technology (ICT) and Education Technology (EdTech) innovations are the consequence of diversified opportunities emerging in practice and research domains.[17] EdTech is transforming education arena from traditional one size fits all model to a personalised and adaptive learning approach through innovative learning initiatives such as Rocketship Education's Learning Lab, New Classroom Schools, Matchbook learning Schools and Ednovate; adaptive

14. UNESCO, "Education: From disruption to recovery."
15. Rebecca Winthrop, Adam Barton, and Eileen McGivney. "Why wait 100 years? Bridging the gap in global education," (Washington DC: Brookings, 2015), 14.
16. "The learning Generation: Investing in Education for a Changing World," International Commission on Financing Global Education, 2016. https://report.educationcommission.org/report/
17. Mason and Pillay, "Opening Digital Learning to Deeper Inquiry."

learning platforms such as Reasoning Mind, Dreambox, Knewton; online educational networks such as Edmodo, Edudemic, Edutopia, ShareMyLesson; Learning Management Systems such as Moodle and BrightSpace; online educational content providers such as Khan Academy, TED, YouTube and Wikipedia; and Massive Open Online Courses (MOOCs) such as Coursera, EdX, Udemy and Udacity.[18] Technology is progressively converging education to personalise learning pedagogies and provide students more freedom over what and how they learn and at what pace. There has been a significant reduction in the cost of digital devices and an exponential increase in computing power during last decade, augmented with high-quality interactive educational tools and contemporary educational technology approaches such as distance learning, Open Educational Resources (OERs), Open Educational Practices (OEP).[19]

Information and communication technologies for development (ICT4D) is focused on minimising the digital divide globally through effective and adaptable use of Information Systems (IS) and technology for the benefit of the deprived communities in developing countries.[20] Technology has allowed us to rethink the design of physical learning spaces to accommodate new and expanded relationships among learners, teachers, peers, and mentors; and offering socially, economically and culturally disadvantaged students more adaptable learning solutions.[21] While most researchers and educators agree that EdTech can be helpful under some circumstances, they are far from a consensus on what types of EdTech are most worth investing in and in which contexts. Moreover, several critiques related to the inability of EdTech initiatives to create a meaningful impact have arisen during the last decade.[22] However, these shortcomings may be considered as resemblance to the trajectories of early technology failures in many other professional fields. It is opined that EdTech may be passing through a *Tipping Point* effect during global COVID-19 pandemic, as, when over 1.57 billion learners (91.4% of total learners) from 192 countries worldwide experienced learning disruptions the world also simultaneously witnessed a

18. Richard Susskind and Daniel Susskind. “The Future of Professions: How Technology will transform the work of Human Experts,” (Oxford: Oxford, 2017), 55-60.

19. Ronghuai Huang, Liu, Tlili, et al. “Guidance on Open Educational Practices during School Closures: Utilizing OER under COVID-19 Pandemic in line with UNESCO OER Recommendation,” Smart Learning Institute of Beijing Normal University, China, May 2020, https://iite.unesco.org/wp-content/ uploads/2020/05/Guidance-on-Open-Educational-Practices-during-School-Closures-English-Version-V1_0.pdf.

20. Anteneh Ayanso, Danny Cho, and Kaveepan Lertwachara. “Information and communications technology development and the digital divide: A global and regional assessment,” Information Technology for Development, 20, no. 1, (May 2013), 60–77.

21. Jean Lave, “Situating learning in communities of practice,” in Perspectives on socially shared cognition, ed. L. B. Resnick, J. Levine, & S. Teasley, (Washington, D.C.: American Psychological Association, 1991), 63-82; “Re-imagining role of technology in education,” US Department of Education, January 2017, https://tech.ed.gov/files/2017/01/NETP17.pdf

22. Diether Beuermann, Julian Cristia, Santiago Cueto, Ofer Malamud, and Yyannu Cruz-Aguayo, “One Laptop per Child at Home: Short-Term Impacts from a Randomized Experiment in Peru,” American Economic Journal: Applied Economics 7, no.2 (2015): 53–80; Robert Fairlie and Jonathan Robinson, “Experimental Evidence on the Effects of Home Computers on Academic Achievement among Schoolchildren,” American Economic Journal: Applied Economics 5, no. 3, (2013): 211-240; Benjamin Piper, Stephanie Simmons Zuilkowski, Dunston Kwayumba, and Carmen Strigel, “Does Technology Improve Reading Outcomes? Comparing the Effectiveness and Cost Effectiveness of ICT Interventions for Early Grade Reading in Kenya,” International Journal of Educational Development 49 (2016): 204–14; Maya Escueta, Vincent Quan, Andre Joshua Nickow, Philip Oreopoulus, “Education Technology: An Evidence-based review,” National Bureau of Economic Research Working Paper 23744, https://www.nber.org/papers/w23744.pdf

massive shift in the learning process to online mode, forcing the global stakeholders, governments, education providers and students alike to test their adaptability to accept online learning paradigm.[23] Emerging COVID-19 era EdTech developments, based on machine learning, big data, and artificial intelligence may intensify their long-term influence positively and progressively on the education arena.

2.3 Education Structure in Pakistan

Pakistan is the world's fifth most populated lower-middle-income South-Asian country with a population of 207.8 million, having 64% of the total population in rural areas with farming as their major occupation.[24] Children, adolescents and youth comprise a dominating percentage of Pakistani society, and 39% of the total population is in the age group 5-19 years.[25] Pakistan also has the highest population and 4th highest rate (47%) of out of school children, adolescents and youth in the world, and their highest concentration (77%) are in secondary school age.[26] Most of the OOSCs are residing in remote, rural or underprivileged city areas with prevailing challenges in providing quality education. A serious inequality prevails in educational attainment levels in Pakistan where more than twice individuals aged 15 years or above are illiterate in rural areas (61.2%) compared to that in urban areas (29.74%).[27] In Karachi (biggest city of Pakistan) alone, the Gini index of Education shows the value of 0.611 in rural areas and 0.346 in urban areas.[28]

Table 1: National Estimate of Out-of-school Children by Educational Level

Education level	**Age (years)**	**Population (5-16 years)**	**Enrolment**	**Out-of-School Children**	
				Number	**%**
Primary	5-9	21,887,353	15,808,459	6,078,894	28%
Middle	10-12	12,336,385	5,854,226	6,482,159	53%
Secondary	13-14	8,179,188	3,206,745	4,972,443	61%
Higher Secondary	15-16	8,385,880	1,895,807	6,490,074	77%
Total		**50,788,806**	**26,765,237**	**24,023,569**	**47%**

Source: Pakistan Education Statistics 2014-15, p. 49

Pakistan's education system mainly comprises three sectors: government (public) schools, private schools and Madrasahs (religious schools). The educational structure in Pakistan is

23.. Malcolm Gladwell. "The Tipping Point: How Little Things Can Make a Big Difference," (Boston: Little, Brown, 2000)

24. "Pakistan: Demographic and Health Survey 2017-18," National Institute of Population Studies Islamabad: Pakistan, accessed on 31 Aug 2020, https://www.nips.org.pk /abstract_files/PDHS - 2017-18 Key indicator Report Aug 2018.pdf; US Census Bureau.

25. "Pakistan social and living standards measurement survey," Pakistan Bureau of Statistics, accessed on 31 August 2020, http://www.pbs.gov.pk/content/pakistan-social-and-living-standards-measurement.

26. "Annual Status of Education Report," ASER-Pakistan, 2019, https://palnetwork.org/wp-content/uploads/2020/02/Annual-Status-of-Education-Report-ASER-PAKISTAN-2019.pdf

27. "Pakistan social and living standards for individuals aged 15 and above. Karachi: Pakistan," Pakistan Bureau of Statistics, (2015)

28. Noman Saeed, and Ambreen Fatima. "Educational Inequality in rural-urban Sindh," *30th AGM of Pakistan Society of Development Economists (PSDE). Islamabad: Pakistan Society of Development Economists (PSDE)*, 2017.

largely divided into five levels as shown in Table 1 below, showing that as high as 77% of higher secondary school-age children are not going to school:

Pakistan's constitution declares it as a responsibility of the state to provide free and compulsory education for children of the age of 5 to 16 years. Article 25A of the 18th Constitutional Amendment, 2010 mentions, "The State shall provide free and compulsory education to all children of the age of five to sixteen years in such manner as may be determined by law" and Article 37-B of Constitution of Pakistan forces the state to remove illiteracy from the country and provide free compulsory education, "The state shall remove illiteracy and provide free and compulsory secondary education within the minimum possible period".[29] Pakistan has also been a signatory participant of the World Conference on Education for All, 1990; Dakar World Education Forum 2000; Millennium Goals, 2000 and the UN Convention on Rights of the Child, 1989; and has assured the world to educate all children in the country. However, all these commitments never materialized sufficiency and the problem of out of school children, adult illiteracy and poor quality of education remained persistent throughout. According to the EFA GEM Report (2015), progress made by Pakistan in terms of reducing out-of-school population is far less than expected, partly due to ethnic and religious frictions, corrupt political leadership and weak democracy.[30]

3. Research Methodology

This section discusses the environment of OOSC and the underpinning factors contributing to a high population of out-of-school children in Pakistan. Data supporting this present study was collected through qualitative interviews with the parents of these out-of-school children living in underprivileged circumstances. The qualitative research method is adopted for data collection as it provides rich descriptions of the situation, and is useful to describe a novel, poorly understood contextual circumstances and to engage in causal inference.[31] The interview participants were selected from the rural areas (*Katchi Abadi*) in Karachi, the largest city of Pakistan and 7th most populated city of the world, with an estimated population of more than the cumulative population of over 35 countries of the world.[32] These rural and low-socio-economic *Katchi Abadi* are spread around the city. In-depth interviews were conducted with 22 parents of OOSC from 6 different geographical locations during the data collection process through snowballing technique to cater for a diversity of contexts. All the interview audio recordings were first translated from the native language (Urdu) into the English language, transcribed and then processed through NVivo software (V12). The research study was approved by the Human Ethics Review Committee (#H18108), Charles Darwin University, Australia. All study participants were provided with written informed consent in the Urdu language.

4. Research Findings

29. "The Constitution of the Islamic Republic of Pakistan (25A)," accessed 31 August 2020, http://www.na.gov.pk/uploads/documents/1333523681_951.pdf

30. "Global Monitoring Report 2015: Education for All 2000–2015: Achievements and Challenges," UNESCO, accessed 31 Aug 2020, https://en.unesco.org/gem-report/report/2015/education-all-2000-2015-achievements-and-challenges

31. S. Sofaer, "Qualitative Methods: What Are They and Why Use Them?," *Health Services Research,* 34, no. 5 Part II, (December 1999):1101–18; RE Hurley, "Qualitative Research and the Profound Grasp of the Obvious," *Health Services Research,* 34, no. 5 Part II, (1999):1119–36

32. "World Population," Worldometer, accessed 31 Aug 2020, https://www.worldometers.info/population/

Data analysis of interviews with parents of out-of-school children provided insights about the environment surrounding OOSC. We have divided the findings into four distinct themes i.e. (i) living standard of OOSC families, (ii) parents' views on importance of education, (iii) Factors behind children being out-of-school, and (iv) interest of OOSC and their families for attaining education.

4.1 The living standard of OOSC families

Findings regarding the living standard of these families covered their financial status, the number of children in each family, education status of parents, and their interaction with technology in daily life. Most families are found living a low quality of life, with a higher number of children in a family, living a low socio-economic lifestyle with significant financial constraints. They struggle for their basic living needs like food and shelter, and therefore the education of their children become their secondary priority. Although most parents were found willing to educate their children, however, due to poverty, they are unable to either start or continue the education of their children. A common element in OOSC families is their larger family size where most families are found having 4 or more children in a family. Family's limited earning resources and larger family structures prevent them from educating their children in private schools available in their vicinity. Most interviewed parents were either uneducated or have not attained education beyond Grade 10. Only three families had both parents educated. It was found that most of them have older technology devices only (television and featured phones).

4.2 Parents' views on the importance of education

The next research theme was parents' views on the importance of education. The interviews analysis revealed that although they were less hopeful to get any financial, academic and societal support to educate their children, they were found much interested in their children education. The parents were found very optimistic about the potential impacts of quality education in their children's lives and the overall betterment of society. They shared their perspectives about the diverse benefits of education for their children. According to the parents, education will not only improve the individual lives of their children, but they also identified a greater good for society. Parents also linked their wish of educating their children with the hardships they faced being uneducated. When parents were asked about their priority for their children; work or education, all parents agreed that education is more important for their children, and after getting a quality education, the children can get better work opportunities.

4.3 Factors behind Out-of-School Children

The third research finding theme deals with the factors other than their socio-economic limitations, due to which their children are either not going to school or have left the schools. Interviews covered three main dimensions i.e. factors related to schools, including schools in the vicinity, condition of government schools, problems in private schools and role of a madrasah (religious schools); why children do not go to school or have stopped going to school; and what do they do when they do not go to school. Responses from the parents were mixed based on their locations; however, most parents informed that there were no government schools in the vicinity, but many private schools and madrasah were located nearby. Parents graded the condition of government schools as worst in terms of the academic standard, environment and teachers' seriousness in the learning process of their students. Due to the devastated condition of government schools, they were comparatively more satisfied with the academic and general standard of private schools. Many parents also send their children to NGO-based private schools due to low school-fees structures. The Madrasah, another educational option, plays a very important role in their

lives as an alternative system which caters for free faith-based education as well as formal education (few madrasahs which provide formal education till Grade-8 alongside religious education). Many parents found preferred sending their children in Madrasah as it helps children keep connected to the religion along with formal education. Parents who do not send their children to school or have stopped sending the children to school blamed unaffordable educational expenses as the main reason for not sending their children to school. Moreover, parents who used to send their children to government school complained about the environment in government schools, children safety and teachers' lack of interest. Responding to the question that what the children do if they do not go to school, parents informed that most children spend their time at home. However, children who have studied in schools and madrasah previously were also found engaged in providing tuitions and religious education to other children.

4.4 Interest in OOSC education

Questions related to the interest of parents and children in the educational process were also asked, along with their willingness to adopt technological tools for education and to acquire vocational skills to support their families. Parents were found overwhelmingly interested in their children education and were found ready to send their children to schools if there if any opportunity that may suit their social and financial limitations. Parents also informed that most of their children, especially those who have passed their ages realise more what they have missed and would be more interested in continuing the educational process. We found that all parents were supportive of education through technology tools. Moreover, as poverty is one of the major reasons behind these children not getting an education, parents were very happy for their children to get vocational education so they may support the families after completing their education.

5. Re-defining learning for OOSC

The COVID-19 pandemic has exposed vulnerabilities; it has also validated extraordinary human adaptability, innovative capabilities and potential. In a post-COVID era, directions set today will have long-term consequences for the future of education. "Yes, the storm will pass, humankind will survive, most of us will still be alive—but we will inhabit a different world".[33] "COVID-19 has the potential to radically reshape our world, but we must not passively sit back and observe what plays out".[34] In the Covid-19 situation, many in the field of education see digital learning as a solution. However, a rapid progression in digital learning platforms during COVID can further lead to an increased gap between winners and losers in the global arena, as well as among students. To spread benefits of digital learning among the disadvantaged OOSC communities equally, there is a need to develop digital solutions that suits their local needs and challenges, serve the purpose within their limits, sustains the efficacy in post-pandemic times, and can be adapted by these communities swiftly. In proposing a solution, we place an emphasis on mixing an education that is inclusive, innovative and adaptable, suited to their socio-economic, technological and cultural circumstances. This 'solution' combines digital home-schooling and one-room schoolhouses, and in doing so provides for sustainable and continued development.

5.1 Digitally Operated One-Room Schoolhouses (DOORS)

33. Yuval Noah Harari, "The World after Coronavirus" *Financial Times,* March 20, 2020, https://www.ft.com/content/19d90308-6858-11ea-a3c9-1fe6fedcca75.

34. "Education in a post-COVID world: Nine ideas for public action," UNESCO, Ethiopian President H.E. Ms Sahle-Work Zewde, Chair of the International Commission on the Futures of Education, accessed 31 Aug 2020, https://en.unesco.org/news/education-post-covid-world-nine-ideas-public-action.

One-room schoolhouses are simply understood to consist of one classroom where a single teacher teaches academic basics to several grade levels of elementary-age boys and girls. During the last three centuries, traditional one-room schoolhouses all over the world have played an important role in shaping the history of education.[35] The one-room schoolhouse has traditionally provided the means for an integrated approach to the curriculum, often mixing age and aptitude. This traditional method can be investigated for 21st-century options to educate OOSC, as it offers room to accommodate technological advancements through integrated approaches. Research indicates that non-cognitive learning abilities of the students improve in a multi-age peer-learning environment, allowing them to mentor relatively less advanced students in that domain.[36] This pedagogical approach helps students to access challenging course material and research methodologies when someone among them has more relevant knowledge and provides the opportunity to educate the less knowledgeable ones.[37] This approach is also being adopted by higher education institutions (HEIs) globally due to inbuilt structural benefits. For example, at Drake University a three-week research course was designed around the same foundation and principles.[38] George Mason University has also experimented with a course design comprising nine undergraduate students and five advanced level high school students working together, where the more experienced ones are found helping the less experienced ones.[39]

Pakistan has a number of one-room schoolhouses in remote and rural areas to provide optimal learning to OOSCs, mostly being operated by various Not-for-Profit organisations. As these schools are in far-away remote areas, good quality teachers from urban areas do not prefer to join these schools. Analysis of benefits, instructional methods and challenges of one-room schoolhouses in Pakistan are discussed in previous literature.[40] These schools can be equipped through technology to provide quality education to OOSCs coming to these schools and to overcome their challenges of attracting quality teachers in these remote locations. Children studying in these one-room schoolhouses can be taught using open educational resources in the form of videos, games, and quizzes through the digital equipment in a controlled setting and their academic progress can be channelised and regulated through Learning Management Systems (LMS), where the role of the local teacher can be re-defined as in-class facilitators and qualified and experienced teachers can monitor and control academic progress of the class remotely.

---

35. Frankie Keels Williams, “Inside the one-room schoolhouse: A look at non-graded classrooms from the inside out,” *National Forum of Applied Educational Research Journal*, 18, no.3 (2015): 1-5, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.621.2965&rep=rep1&type=pdf

36. Lindsey Blias Cundra, Caroline Ann Benzel, and James Reid Schwebach, “Using the one-room schoolhouse method: The design and teaching of a summer undergraduate research course in Phage Biology,” *Perspectives on Undergraduate Research & Mentoring (PURM) 6.1,* 2017, https://www.elon.edu/u/academics/undergraduate-research/purm/wp-content/uploads/sites/923/2019/06/Cundra_et_al_6.1.pdf

37. Pritha Bhuiyan, Nirmala Rege, Avinash Supe, *The art of teaching medical students*. (Delhi: Elsevier India, 2015).

38. Larhee Henderson, Charisse Buising and Piper Wall, “Teaching undergraduate research: The one-room schoolhouse model,” *Biochemistry and Molecular Biology Education*, 36: 28-36, https://doi.org/10.1002/bmb.20134.

39. Cundra, Benzel, and Schwebach, “Using the one-room schoolhouse method”.

40. Badar, “Extending openness”; Faisal Bin Badar and Jon Mason, “Digital Learning Transformation for One-room Schoolhouses in Rural Pakistan,” *Proceedings of the 27th International Conference on Computers in Education. Philippines:Asia-Pacific Society for Computers in Education*, 2019: 280-285.

5.2 Digital Home-schooling

For thousands of years, parent-led home-based learning has remained a norm. The nineteenth-century experienced a shift towards global emergence and dominance of the institutionalised schooling system.[41] However, during the last two decades, parents, particularly in the USA, are reverting to home-schooling and the trend is progressing exponentially around the world.[42] Research conducted on home-schooled children shows that these children are well-developed emotionally, socially and psychologically; and have scored similar or better results in exams, when compared with their counterparts in public and private schools.[43]

Parents home-school their children for various reasons. In the case of OOSC parents in Pakistan, one valid reason can be non-availability of access to free quality education to these underprivileged children through traditional means. However, as the parents of these OOSC are generally not well-educated, they are not capable of educating their children by themselves. The literacy gap can be filled by digital tools, where, similar as DOORS model, the parent can become the facilitator for the children at home, and academic learning process can be managed through digital learning content, pre-defined assessments and remotely accessible teachers to guide the children. During COVID-19, many schools have shifted to online schooling methods to continue the learning process without disruption, and the experiences gained by these institutions and individuals can be utilised to apply successful strategies on OOSC as well.

6. Conclusion

In today's world where one out of five children are out-of-school and the efforts to educate them are largely not yielding meaningful outcomes, we need to rethink our fundamental approach to educate this underprivileged segment of the global community. Fortunately, COVID-19 has made global communities to think differently, and to redefine professional and personal ways of doing work; and education is one of them. At this historical crossroad, we may need to ask ourselves some elementary questions regarding education such as, what is the basic role of education; what sustainability means going forward from COVID; and what can be meaningfully sustained? We need an education that goes beyond providing basic knowledge and skills and leads to awareness, ideas and action that help us advance towards sustainable development, that empowers learners to transform themselves and transform societies. We also need the use of

---

41. Brian Ray, "A Review of research on Homeschooling and what might educators Learn?," *Pro-pocicoes* 28,no. 2, August 2017: 85-103, https://doi.org/10.1590/1980-6248-2016-0009.

42. Paula Rothermel, *International perspectives on home education: Do we still need schools?* (London: Palgrave Macmillan, 2015), 1-17.

43. Brian Ray, "Academic achievement and demographic traits of homeschool students: A nationwide study," *Academic Leadership Journal*, 8, no.1, February 3, 2010,http://www.nheri.org/AcademicAchievementAndDemographicTraitsOfHomeschool StudentsRay2010.pdf; Joseph Murphy, *Homeschooling in America: Capturing and assessing the movement* (New York: Thousand Oaks, 2012); Deani Van Pelt, "The choices families make: Home schooling in Canada comes of age," *Fraser Forum*, 15-17, http://www.fraserinstitute.org/Commerce.Web/product_files/The%20Choices%20F amilies%20Make~~%20Home%20Schooling%20in%20Canada%20Comes%20of%20 Age-Mar04ffpelt.pdf; Lawrance M. Rudner, "Scholastic achievement and demographic characteristics of home school students in 1998," *Educational Policy Analysis Archives*, 7, no. 8, http://epaa.asu.edu/ojs/article/viewFile/543/666

technology in education that brings the learners close to each other instead of widening the gaps between winners and losers in the global arena. After this crisis, Governments around the world will need to reassess learning systems and pedagogies to meet the challenges faced by OOSC. This may be once in a generation opportunity to rethink, redefine and improve education the way it leads to a sustainable future for OOSC. Education leaders need to use this period of disruption to ensure what people learn is truly relevant to their lives and the survival of the planet and inspire today's learners to create new visions and paradigms for tomorrow to make this world a better place.

Bibliography

ASER. "Annual Status of Education Report," ASER-Pakistan, 2019, https://palnetwork.org/wp-content/uploads/2020/02/Annual-Status-of-Education-Report-ASER-PAKISTAN-2019.pdf

Ayanso, Anteneh, Danny Cho, and Kaveepan Lertwachara. "Information and communications technology development and the digital divide: A global and regional assessment," *Information Technology for Development*, 20, no. 1, (May 2013): 60–77.

Badar, Faisal B. "Extending openness in education support services for out-of-school children in underprivileged circumstances." *Proceedings of the Learning Innovations and Quality (LINQ)*, no. 2, (2019): 18-27.

Badar, Faisal B., and Jon Mason, "Digital Learning Transformation for One-room Schoolhouses in Rural Pakistan." *Proceedings of the 27th International Conference on Computers in Education. Philippines:Asia-Pacific Society for Computers in Education*, 2019: 280-285.

Bhuiyan, Pritha, Nirmala Rege and Avinash Supe, *The art of teaching medical students*. (Delhi: Elsevier India, 2015).

Cundra, Lindsey B., Caroline Ann Benzel, and James Reid Schwebach. "Using the one-room schoolhouse method: The design and teaching of a summer undergraduate research course in Phage Biology." *Perspectives on Undergraduate Research & Mentoring (PURM) 6.1,* 2017, https://www.elon.edu/u/academics/undergraduate-research/purm/wp-content/uploads/sites/923/2019/06/Cundra_et_al_6.1.pdf

Gladwell, Malcolm. "The Tipping Point: How Little Things Can Make a Big Difference." Boston: Little, Brown, 2000.

Government of Pakistan. "The Constitution of the Islamic Republic of Pakistan (25A)." Accessed 31 August 2020. http://www.na.gov.pk/uploads/documents/1333523681_951.pdf

Harari, Yuval, N. "The World after Coronavirus." *Financial Times,* March 20, 2020, https://www.ft.com/content/19d90308-6858-11ea-a3c9-1fe6fedcca75

Henderson, Larhee, Charisse Buising and Piper Wall, "Teaching undergraduate research: The one-room schoolhouse model." *Biochemistry and Molecular Biology Education*, 36: 28-36, https://doi.org/10.1002/bmb.20134.

Huang, Ronghuai, Liu, Tlili, et al. "Guidance on Open Educational Practices during School Closures: Utilizing OER under COVID-19 Pandemic in line with UNESCO OER Recommendation." Smart Learning Institute of Beijing Normal University, China, May 2020. https://iite.unesco.org/wp-content/ uploads/2020/05/Guidance-on-Open-Educational-Practices-during-School-Closures-English-Version-V1_0.pdf

Hundred. "Spotlight: Quality education for all during Covid-19 crisis." (Report No. #011). https://hundred-cdn.s3.amazonaws.com/uploads/report /file/15/hundred_spotlight_covid-19_digital.pdf

Hurley, RE. "Qualitative Research and the Profound Grasp of the Obvious." *Health Services Research,* 34, no. 5 Part II, (1999):1119–36.

International Commission on Financing Global Education. "The learning Generation: Investing in Education for a Changing World,", 2016. https://report.educationcommission.org/report/

Kallis, G. *Degrowth*. Agenda Publishing: Newcastle upon Tyne, UK, 2018.

Mason, Jon, and Hitendra Pillay. "Opening Digital Learning to Deeper Inquiry," In *The International Handbook of E-learning, 2, Implementation and Case Studies*, edited by Mohammad Ally and Badrul Khan, 1-10. New York: Routledge, 2015.

Murphy, Joseph. *Homeschooling in America: Capturing and assessing the movement* (New York: Thousand Oaks, 2012); Deani Van Pelt, "The choices families make: Home schooling in Canada comes of age," *Fraser Forum*, 15-17, http://www.fraserinstitute.org/Commerce.Web/product_files/The%20Choices%20Families%20Make~~%20Home%20Schooling%20in%20Canada%20Comes%20of%20Age-Mar04ffpelt.pdf.

National Institute of Population Studies, Pakistan. “Pakistan: Demographic and Health Survey 2017-18.” Accessed on 31 Aug 2020. https://www.nips.org.pk /abstract_files/PDHS - 2017-18 Key indicator Report Aug 2018.pdf; US Census Bureau.

Pakistan Bureau of Statistics. “Pakistan social and living standards for individuals aged 15 and above. Karachi: Pakistan,” (2015).

Pakistan Bureau of Statistics. “Pakistan social and living standards measurement survey.” Accessed on 31 Aug 2020. http://www.pbs.gov.pk/content/pakistan-social-and-living-standards-measurement.

Ray, Brian. “A Review of research on Homeschooling and what might educators Learn?,” *Pro-pocicoes* 28, no. 2, August 2017: 85-103, https://doi.org/10.1590/1980-6248-2016-0009

Ray, Brian. “Academic achievement and demographic traits of homeschool students: A nationwide study.” *Academic Leadership Journal*, 8, no.1, February 3, 2010,http://www.nheri.org/AcademicAchievementAndDemographicTraitsOfHomeschooltSudentsRay2010.pdf.

Rothermel, Paula. *International perspectives on home education: Do we still need schools?* (London: Palgrave Macmillan, 2015), 1-17.

Rudner, Lawrance M. “Scholastic achievement and demographic characteristics of home school students in 1998.” *Educational Policy Analysis Archives*, 7, no. 8, http://epaa.asu.edu/ojs/article/viewFile/543/666

Saeed, Noman, and Ambreen Fatima. “Educational Inequality in rural-urban Sindh,” *30th AGM of Pakistan Society of Development Economists (PSDE). Islamabad: Pakistan Society of Development Economists (PSDE)*, 2017.

Sofaer, S. “Qualitative Methods: What Are They and Why Use Them?” *Health Services Research,* 34, no. 5 Part II, (December 1999):1101–18.

Susskind, R., and Susskind, D. “The Future of Professions: How Technology will transform the work of Human Experts.” Oxford: Oxford, 2017.

UNESCO. “Global Monitoring Report 2015: Education for All 2000–2015: Achievements and Challenges,” Accessed 31 Aug 2020. https://en.unesco.org/gem-report/report/2015/education-all-2000-2015-achievements-and-challenges

UNESCO. “Education: From disruption to recovery.” Accessed 31 Aug 2020. https://en.unesco.org/covid19/educationresponse

UNESCO. “Sustainable Development.” Accessed 31 Aug 2020. https://en.unesco.org/themes/education-sustainable-development/what-is-esd/sd

UNESCO. “263 million children and youth are out of school from primary to upper secondary,” UNESCO Institute of Statistics (UIS) Fact Sheet No. 48 (UIS/FS/2018/ED/48), Media Report, Feb 2018. http://www.unesco.org/new/en/media-services/single-view/news/263_million_children_and_youth__are_out_of_school_from_primar/

UNESCO. “New Methodology Shows that 258 Million Children, Adolescents and Youth Are Out of School,” UNESCO Institute of Statistics (UIS) Fact Sheet No. 56 (UIS/FS/2019/ED/56), September 2019. http://uis.unesco.org/sites/default/files/documents/new-methodology-shows-258-million-children-adolescents-and-youth-are-out-school.pdf

Williams, Frankie, K. “Inside the one-room schoolhouse: A look at non-graded classrooms from the inside out.” *National Forum of Applied Educational Research Journal*, 18,no.3(2015):1-5, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.621.2965&rep=rep1&type=pdf

Winthrop, R., Barton, A., and McGivney, E. “Why wait 100 years? Bridging the gap in global education.” Washington DC: Brookings, 2015.

Wolff, L, “Sustainability Education in Risks and Crises: Lessons from COVID-19.” *Sustainability* 12, (2020). https://doi:10.3390/su12125205

Worldometer. “World Population.” Accessed 31 Aug 2020, https://www.worldometers.info/population/

Zewde Sahle-Work. “Education in a post-COVID world: Nine ideas for public action.” UNESCO. Accessed 31 Aug 2020, https://en.unesco.org/news/education-post-covid-world-nine-ideas-public-action