Openness in education has been a positive driver of change for over two decades. Open education and digital learning provide an attractive learning option for out-of-school children, which allows them to learn at their own pace, at their chosen location and time (Clark & Mayer, 2011). Open and distance learning environments also provide flexibility in course selection and assessments which are otherwise not available in conventional educational systems (Singh, 2012). Education in developing countries, particularly in underprivileged context, could be transformed by and benefit from e-learning through the effective and innovative application of digital technology (Badar et al., 2018).

While leveraging technological advancements, several global initiatives have made it their mission to educate all children of the world and to reduce the large numbers of out-of-school children (OOSC). Results to date, however, are not promising. A few years prior to COVID-19, UNESCO (2018) had identified that around 258 million children did not have access to school education and an additional 100 million children do not complete primary education. Most of these children are from the poorest backgrounds of the world. The problem is far deeper than a yearly statistic as it has been calculated these underprivileged children need another 100 years to catch up with their counterparts (Winthrop & McGivney, 2015); and by 2030, approximately 9 out of 10 children from low-income countries are anticipated to reach their adulthood without the skills they need to progress (The Learning Generation, 2016). While the main reasons behind out-of-school secondary level children are poverty, location, and gender, learning models based on technology can potentially provide access to people who live in a remote location where there are no schools, teachers and libraries (Ally, 2009). The number of OOSC is even more alarming as a consequence of COVID-19 and now exceeds one billion. This demands re-thinking the strategies to achieve sustainable change, particularly in underprivileged contexts.

Our research context is underprivileged out-of-school children (OOSC) living in Pakistan. Pakistan is the fifth most populated country, with one of the highest out-of-school children population in the world. Most of these children are from rural and remote underprivileged areas, with challenges such as inadequate numbers of schools and quality teachers, poverty, and cultural/social barriers to education attainment goals. Our research is focused on identifying ways to develop adaptable and sustainable approaches to educate underprivileged out-of-school children in rural and remote areas of Pakistan through Digitally Operated One-Room Schoolhouse (DOORS). The DOORS model combines traditional one-room schoolhouse methods with contemporary Educational Technology (EdTech) solutions and Open Education Resources (OERs) to provide customised learning opportunities based on principles of inclusiveness, sustainability, and scalability. During the last three centuries, traditional one-room schoolhouses all over the world have played an important role in shaping the history of education (Williams, 2005). These schools adopted the means for an integrated pedagogy to the curriculum combined with a peer-learning approach, often mixing age and aptitude. Thus, the one-room schoolhouse integrates peer-mentorship into the curriculum design directly and provides a more conducive learning environment as compared to the traditional grade-based learning approach (Cundra, Benzel, & Schwebach, 2017). Open education and digital learning provide an attractive learning option for out-of-school children, which allows them to learn at their own pace, at their chosen location and time (Clark & Mayer, 2011). Open and distance learning environments also provide flexibility in course selection and assessments which are otherwise not available in conventional educational systems (Singh, 2012). Education in developing countries, particularly in the OOSC context, could be transformed by and benefit from e-learning through the effective and innovative application of digital technology (Badar et al., 2018). The EDvantage Digital Learning System (EDLS) is an integrated DOORS approach to teaching out-of-school children in rural Pakistan using EdTech in one-room schoolhouse environments using a
multigrade teaching method. The educational objectives of EDLS include inclusive education and a locally responsive learning environment, where social skills and ethics, and problem-solving and self-dependent working skills are contextual. The EDLS five-step multidimensional implementation model focuses on (i) understanding OOSC local challenges and limitations, (ii) creating active engagement and ownership of stakeholders including their parents and local influencers in the OOSC educational process, (iii) developing EDLS campus for formal schooling of OOCs according to their available time, travel restrictions, and technological and other limitations, (iv) Educating parents on providing OOSC with a conducive learning environment at home so their academic and non-academic learning at EDLS may be supplemented by the home atmosphere, and (v) monitoring and reviewing the outcomes of measures taken all levels to find the areas of improvement, and implementing improvement strategies to fill the gaps.

To date, our research reveals that the availability of qualified and experienced teachers is the weakest link in educating OOSC, as these schools are in far-away remote areas that do not attract good quality teachers from urban areas. In addition, the locally trained teachers have limitations in terms of their educational backgrounds, exposure to the latest teaching techniques and technology related educational developments. To overcome these limitations, EDLS has adopted a technology-based learning and schooling system to provide global level education to these deprived children. The operational structure at EDLS comprises (i) a local facilitator who is present in class and is trained to operate ICT equipment, (ii) a qualified remote teacher connected online, (iii) pre-defined OER based learning and assessment content designed by qualified educators and is available with a local facilitator in online and offline modes, and (iv) required ICT equipment and academic material to run the learning and assessment process in class such as LMS portal, OERs, laptop, a smart TV/computer monitor, a Wi-fi Camera, internet connections, and printed learning and assessment material. The academic process in class follows a pre-defined weekly learning plan by a local facilitator under the supervision of a remotely connected qualified teacher.
EDLS students go through an initial assessment after their enrolment, and then they are broadly divided into a basic group (those who have never been to school), and an advance group (previous school’s dropouts). Each group is further subdivided into high, medium, low levels, according to their learning progress and capacities. All students are regularly assessed and are moved up or down the levels according to their progress. This arrangement provides a personalised learning environment to the students where every student progress in class according to their interest, capacity and understanding of learning content. Due to its centrally managed academic and technical base, starting a new EDLS campus in any rural area requires minimum material and financial resources, compared to any traditional school set-up, and therefore, it can be easily opened and financially supported with a minimum budget.
A real-life successful case study provides evidence that the results are encouraging, indicating that an out-of-the-box DOORS approach of the EDLS model to educate OOSC can become successful through an understanding of local challenges, actively engaging stakeholders, and adapting learning structure suited to OOSC needs. Fortunately, in today’s digital era, this can become a reality and further research and innovation can provide new opportunities to these disadvantaged children.

The EDLS-DOORS research and practice provides an inclusive and equitable opportunity to the global open education community to strengthen the learning model by guiding the implementation team to utilise the most suitable OERs and by connecting them to more underprivileged communities around the world for implementation of this model. Through this session, the EDLS-DOORS model will be explained to wider OERs supporting community who can help refine the model to become more inclusive and equitable and implement it at new geographical locations.