

Learning environments in armed conflicts: lessons learnt from the evolution of school design in Rwanda

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Abstract

Through the evolution of school design in Rwanda, from before the onset of the 1994 genocide until its present development stage, it is discovered that this conflict had opened up opportunities to reevaluate, improve and innovate the overall education system. This is clearly manifested in Rwandan Ministry of Education (MinEduc)'s adoption of Child-Friendly Schools (CFS) guidelines and collaboration with United Nations International Children's Emergency Fund (UNICEF) to develop design strategies and assessment tools of students' performance. Recognizing this potential, this thesis aims to investigate the influence of learning environments affected by armed conflicts on children's resilience and cognitive development. Quality of learning environments has long-term effects on the national human resource development as it affects the effectiveness of learning among students. In regards to the attributes of physical learning environment in schools in Rwanda, the methods include exploring its five key aspects – planning, typology, construction, environmental and sociological – within the timeframe of before, during and after the genocide occurred. Two case studies that bear substantial architectural and cultural significance have been reviewed in these aspects. Findings show that the potential of overcoming the qualitative challenges of school design in armed conflicts is highly relative to the interpolation of understanding natural surroundings, accessibility to suitable building materials and construction method, community involvement and policy making.

Keywords: learning environment, school design, resilience, armed conflict, children's cognitive development.



1 Introduction

Education is innately political [1]. The perception of schools representing political systems and regimes, and as symbols of peace has made the educational system a prime target in many civil wars [2]. In post-genocide Rwanda, there was still some insurgency until 1999, which physically affected school design [3]. This research explores components of education that can be developed or manipulated to endure the challenges of armed conflicts while preventing disruption of children's education under the circumstances.

It is also important to see how the standardized school layout developed by the Rwanda Ministry of Education (MinEduc) and Rwanda Education Board (REB) that are being implemented in almost every school in Rwanda affects the quality of comfort, students' learning abilities and performance. The typical layout and specifications might be time and cost-effective in the post-conflict period when schools need to be built rapidly in pursue of a speedy socio-economic recovery. However, the quality of learning environments and the effectiveness of learning itself is often compromised. In the current state where the nation should be marching towards skill development and intellectual enhancement, the quality of learning environments plays an important role in the effectiveness of overall education.

Conducive learning environments involve combining input from all stakeholders which would create 'creative classroom solutions' and elevate society from the harsh impacts of conflict as a source of resilience. This involves spatial (tangible) controls and conceptual (intangible) settings. With deep understanding and expertise in the area, it is the responsibility of architects/designers and educationalists to integrate and translate both elements into an operative plan. In the process, the community may be engaged through participation in establishing objectives, cultural perimeters and construction.

2 Research framework

This research framework is devised in relevance to the literature review and research objectives. The study will investigate elements shaping Rwanda's education and socioeconomic sectors in relation to influencing factors, within the context of pre-conflict (before the 1959 retaliation), mid-conflict (during the 1994 genocide) and post-conflict (after the 1994 genocide).

Within these contexts, the components of preparedness, resilience recovery are identified, and relationships are synthesized to discover their impacts on the evolution of learning environments and education quality in Rwanda. To establish this in a tangible sense, several schools in various regions of Rwanda were selected as case studies, with two of them presented in this paper.



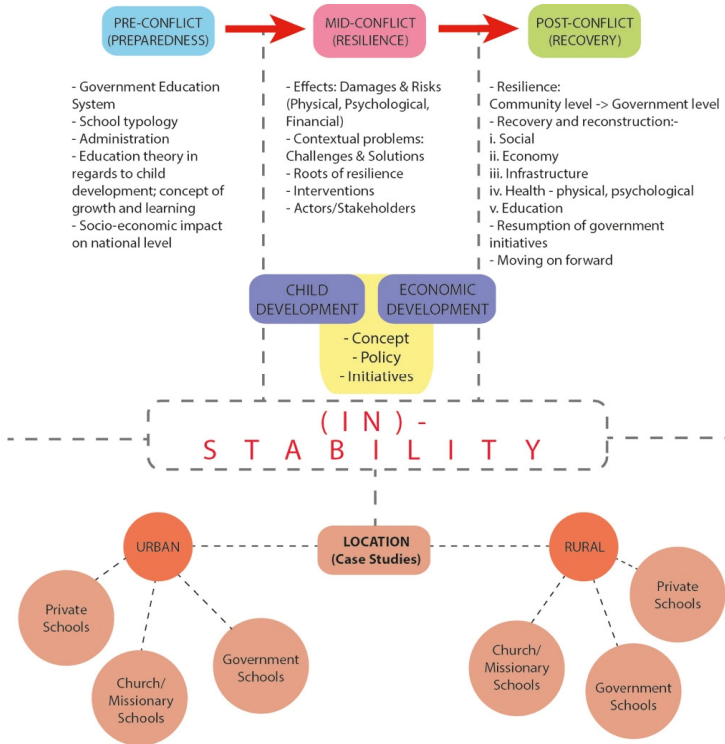


Figure 1: Research methodology framework.

3 Literature review

A research by Akresh and de Walque [4] explored the impacts of Rwandan genocide on children's human capital investment, focusing specifically on primary level schooling as 93 percent of the population under 35 did not complete primary education. This further supports the core subject of this research – *Groupe Scolaires* – a combination of primary and *tronc commune* schools, along the timeline of armed conflict (before, during and after). As an extension of their social and psychological impact research that focused on enrollment and grade-completion factors, this thesis utilizes those data to determine the feasibility of the proposed idea or concept of conflict-resistant school design.

Another prominent literature emphasizes on the long-term effects of physical destruction caused by armed conflicts by Akbulut-Yuksel [5]. Although it focused on World War II, both studies suggest similar distress and impacts on children's schooling – completion of fewer years of schooling and consequently, lower labour market earnings in the future. Thus, the results imply the importance of policies targeting primary school-age children given the long-term presence of war impacts. In addition, the author's other findings suggest that the “destruction of schools and the decline in number of teachers are important factors causing the fall in education”.

3.1 Learning environments in armed conflicts

Extensive research has been done on the effects of war on education. One that centers on Middle East; specifically Palestine, was written by Kotob [6]. She came to a conclusion that in relatively stable conflict areas, insular school designs lack flexibility and unable to integrate effectively into the neighbourhood context, thus undermining the Palestinian education as a whole. However, informal spaces inherently created by the community have proven to be a resource that can be developed for a more wholesome and consistent process of education. She also argues that educationalists and architects often have the same vision and objectives in their collaborations for projects in such circumstances but the outcome is most often equivocal, therefore open to a wide array of interpretation. The emphasis in this matter is that their roles are crucial in holistically designing preventive, adaptive and rehabilitative strategies for educational infrastructures physically affected by armed conflicts.

3.1.1 Education as a means of resilience in conflicts

In a journal article, Toros [7] acknowledges the significance of schools as a resource of promoting resilience in war-affected children; *“Wars and conflicts destroy ecosystems (Winter, 1998). In conflict situations, schools can provide a “supportive context” for children within the larger social ecology (Betancourt, 2005, p. 311). Bronfenbrenner’s theory enables to consider the role and importance of the school as the resource to foster the resilience in children affected by the conflict.”* [7]

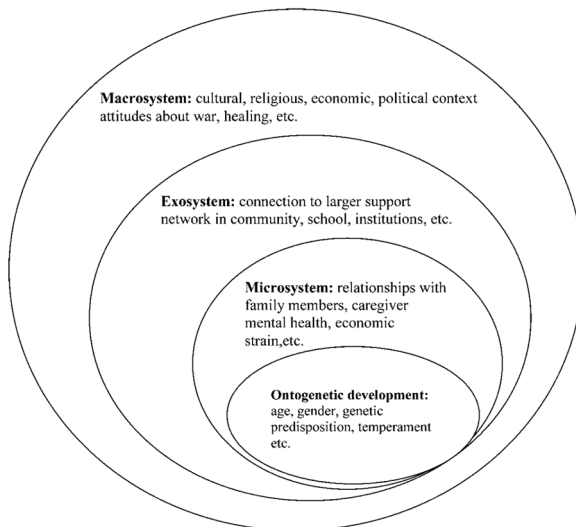


Figure 2: The Social Ecology of Mental Health and Social Support for War-affected Children (adapted from Bronfenbrenner, 1979; Elbedour 1993) [9].

This research is premised upon the theory of ecology [8] with emphasis on schools as part of a child's immediate environment and local support system. The theory revolves around the dynamic interaction between children and the environment in which they live. The components of 'environment' are expanded into "multiple, interrelated settings of child development and the interactions that occur between them" [9]. Therefore, it is inherent that schools are also medium for psychosocial support, source of new information and subsequently an outlet of self-resilience against unsettling situations. This concept is further explored in Jean Bernard's [10] spatial framework of learning environments. As explained by Kotob [6] in her study;

"By using this framework, it is understood that a learning environment contains within it spatial characteristics – both territorial and architectural – that need to be analyzed. Each of the layers in this conceptual framework is bound by a physical, architectural manifestation" [6].

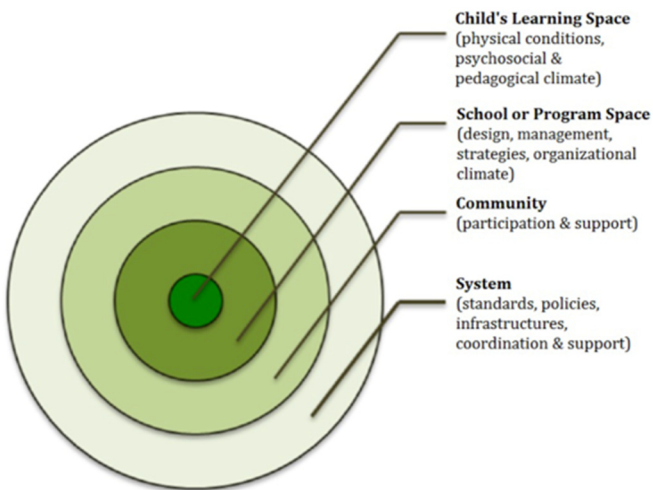


Figure 3: Learning Environment Spatial Framework Diagram (Bernard, J., 2012) (Source: UNESCO, 2012).

3.1.2 Psychological support and psychosocial rehabilitation

The following statement by Bernard [10] highlights the point of mergence between the physical and cognitive traits of learning environments; *"This common space (Teaching and Learning) is where the tangible and intangible elements of the environment merge...The quality of these interactions depends not only on how well the environmental elements support learning but also on the skill of the teacher in motivating, managing, building self-efficacy and scaffolding the learning sequences"* [10].

3.1.2.1 Quality of education: "schooling" vs. "education" *"Now, as I said, the challenge is a challenge of having quality education. And by quality education,*

I go back to the same point: students learn freely and with relevant education..." [11]. In this case, the government plays an important role in developing active self-learning models that blend well with national syllabus. This study also tries to bring forward an argument about the relation between active self-learning and environmental psychology, which will be further explored from architectural perspectives.

3.1.2.2 Role of international organizations and civil bodies International organizations have the capacity to provide aid in various aspects on a bigger scale – physical, financial, medical and psychological, including providing the capacity to rebuild or re-establish schools and other educational institutions as safe spaces, be it physical or programmatic. For example, UNICEF has developed Child Friendly Spaces (CFS) Manual and the Transitional Learning Spaces in Emergencies (TLSE) Compendium which function as a tool to aid decision-making process in creating learning environments that revolve around children's well being. This is an important platform where technical professionals such as architects, engineers and planners may contribute their knowledge and expertise.

4 Empirical setting: Rwanda Genocide, 1994

As of 2012, the Rwandan population had grown to 10,515,973 with population density of 415 inhabitants/km² and 64.5 year of life expectancy at birth [12]. The Education sector saw an increase in net enrollment into primary school from 95.9% in 2011 to 96.5% in 2012; and 25.7% to 28% in secondary school in the same period. In higher education field, the number of students had increased from 73,674 in 2011 to 76,629 in 2012 [13]. For primary education, the pupil to teacher ratio is 59, while the pupil to classroom ratio is 82. The rising number of students indicates that more school infrastructures are expected, especially to reduce classroom overcrowding. In lieu of the national development agenda to pursue a knowledge-based economy [14], the quality of education – in terms of both physical learning environment and curriculum – must be improved.

4.1 Armed conflicts in Rwanda: impact on schools

With the 1994 genocide in Rwanda negatively impacting school children by depriving them of one-half year of schooling, the negative impact of the genocide on the schooling attainment of exposed children will likely have long-term negative welfare consequences by reducing future adult wages and productivity [4]. The impact is greater in provinces where the genocide intensity was higher. It is important to understand the specific mechanisms by which the genocide impacted children's schooling in order to develop responses in terms of policy and protection strategies. Some of the likely mechanisms indicated in the research outcomes of their study include killing of educated individuals, orphanhood, decline in household economy, destruction of schools and lack of teachers.



4.2 Education in Rwanda: National Education Policies, Strategies, their influence on physical infrastructure and quality of service

4.2.1 Pre-1994 genocide

Between 1982 and 1994, the vast majority of Rwandans who live in rural areas suffered immoderations as a result of the plummeting of coffee price in the international market, a structural adjustment program introduced by the World Bank and IMF. The *Interahamwe* took advantage of the situation for militia recruitment. The social inequality that occurred had imposed a limitation of access into obtaining education, further contributing to the issue with growing ignorance among the people. The immense social discontent was manipulated by the Habyarimana regime into the execution of their genocide plan.

Social exclusion of the Rwandan majority was further cultivated through propagation of ethnic divisions in education, where the ruling elite were given higher preference and benefits. Education in Rwanda was seen as a political mechanism for sustaining the social situation where its political agendas matched that of the elites [1]. These agendas were characterized by exclusion, deprivation and repression.

School curriculum and teaching approach play significant roles in identifying spatial requirements of the learning environment. During this period, most schools adopt typologies typical to church schools or government standards due to dependency on the values of the school founder.

4.2.2 Mid-1994 genocide

With the commencement of the genocide in April 1994, 65% of the 1,836 schools were destroyed [2]. More than 600 of them were primary schools [24]. Teachers were particular targets for killing as they symbolized the elite [1]. The end of genocide left surviving schools in poor conditions and inadequately trained teachers. Class repeaters and school dropout increased, especially among orphans and children from impoverished families [15]. Generally, education halted during the course of the genocide as many Rwandans fled to refugee camps in Tanzania and the Democratic Republic of Congo (DRC).

4.2.3 Post-1994 genocide

Just two months after the end of genocide, the Ministry of Education (MinEduc) reopened in September 1994. Discrimination had become illegal and the new Ministry had set a new regulation where ethnic and regional identification of students and teachers are prohibited. Therefore, advancements will be based only on merit [2].

Rwanda MinEduc had been proactive in developing its Education Sector Strategic Plans (ESSP). The Education For All (EFA) guidelines are also adopted in Rwanda's Education policies, which main objective is to provide the benefits of education to "every citizen in every society". Main issues addressed in achieving these aims are: high dropout and repetition rates, review of school curricula and teaching methodology, and adult illiteracy – all of which influences the spatial provision and quality of school environment to foster effective learning.



In accordance to the Millennium Development Goals (MDG), environmental sustainability has been adopted as a key objective within any infrastructure program, including for education. The government had been adamant in the use of appropriate sustainable construction material, renewable resources, limiting transport and reducing ecological impact. MinEduc had particularly adopted this approach in its Child Friendly Schools (CFS) Infrastructure Standards and Guidelines for Primary and Tronc Commun Schools, established in 2009. The Guideline was developed in close partnership and coordination with UNICEF with specifications based on Rwandan context; adhering to the agency's original CFS Manual (2009).

The increased numbers of pupils in primary and *Tronc Commun* will demand more classrooms, schools and infrastructure. This is where the construction department of MinEduc is responsible – issuing guidelines on construction and monitoring. Districts determine the proposed location of new schools and classrooms submit their proposals to the Construction Department of MinEduc for approval and funds. Level of under-utilization in schools and how much growth can be absorbed through better utilization of existing structures are also analyzed. Issues of accessibility are addressed with the philosophy of building schools closer to communities [18].

5 Presentation of case studies

This paper presents two schools in various regions of Rwanda – in Murambi (rural area) and Kigali (urban area). This selection is justified by the fact that the 1994 genocide affected these areas differently [3] despite having similar built and administration organizational structure. It is important to identify the various impact intensity levels in order to discover varying factors and outcomes of school design evolution throughout the period of armed conflict.

5.1 Case study 1: G.S. Kanyinya Primary and Lower Secondary School, Kigali

Similar to more than 50 percent of schools in Rwanda, G.S. Kanyinya was built by western missionaries in 1956. The original school, which comprised of two classroom blocks, was severely damaged during the long on-going conflict that started in 1959. It had seen the worst during the 1994 genocide, which resulted in its demolition. Post-genocide, the school was rebuilt as part of the reformation of the national education system. To date, the school also includes a block of three classrooms and toilet facilities for pre-primary education (for children aged 4 to 6 years old). Evidently, due to proper planning and more stable funding, the most recent pre-primary was designed with a lot more careful consideration of site context, children scale, variation of activities and classroom furniture.

The school was rebuilt progressively throughout its operational years. Starting from 1995 to present times, new classroom blocks have been added onto the site, expanding its site plan without any pre-determined layout outline. The quality and quantity of these gradual additions were influenced by a few factors – fund



availability, stakeholders' involvement and accessibility to building materials. This combination creates a more complex environment for students with a wider age range – 7 to 15 years old – who possess different cognitive development rates and needs. Gender and cultural construct are also an important factor in creating a conducive learning environment as they affect social interactions and self-esteem. From observation, the abundant availability of undefined spaces in G.S. Kanyinya's expansive compound allows students to explore their cognitive realm through experimental social and environmental interaction, daily routines and intellectual growth.

The original classroom blocks were demolished to make way for expansion. However, in 1994, the school, which had comprised of several classroom blocks by then, suffered severe damages due to the genocide. Its close proximity to the main Kigali-Ruhengeri highway made it an obvious target. Classrooms and administration offices were looted and water services were cut off.

Based on input gained from the interviews and literary references such as the Rwanda Child Friendly Schools (CFS) Infrastructure Standards and Guidelines for Primary and *Tronc Commun* Schools [18], aspects of school design evolution are tabulated against the timeline of the schools' existence in relation to the 1994 genocide conflict in Rwanda. The elements of learning environment qualities are identified, as represented in the following tables, and used as a basis for observation.

5.2 Case study 2: Murambi Technical Secondary School, Murambi, Nyabagabe

Presently known as Murambi Genocide Memorial Center, this former school was constructed in early 1994. The then partially built school became a refuge for genocide victims of Murambi and its neighbouring districts – Gikongoro, Mudusomwa, Kinyamakara and Karama. In total, they were a group of 50,000 refugees including women and children who were killed on the morning of 21 April 1994 in a mass slaughter.

Strategically located on a hilltop and isolated from civil amenities, the school was a selected choice for this “systematic killing” agenda. Authorities in charge had directed the large groups of refugees to the then yet-to-be-completed Murambi Secondary School in guarantee of security and protection. Once there, they were denied water and food; even the water pipes had been disconnected and the authorities denied external provisions. Roadblocks were set up around the vicinity to disallow refugees from going out of the school grounds to look for basic necessities.

Although the school did not suffer much physical destruction, the event that took place within its premises then, had redefined its present phenomenological values. In terms of rehabilitation to suit its current use, only basic architectural works needed to be done, especially in the main exhibition building. The rest of the facilities were left as they were during the genocide.



6 Conclusion

It is discovered that the Rwandan genocide had opened up opportunities to reevaluate, improve and innovate the overall education system, especially architecturally. This is clearly manifested in MinEduc's adoption of CFS guidelines and collaboration with UNICEF to develop school design strategies and complementary assessment tools of students' performance. In regards of the attributes of physical learning environment in schools in Rwanda, the study explored its five key aspects – planning, typology, construction, environmental and sociological.

Site selection and planning are essentially determined by the District in accordance to land availability, prioritizing accessibility. In most cases, schools are built in near proximity to churches and other main communal services such as health and nutrition centers. Before the genocide, the maximum walking distance allowed from a students' home to school was 10 kilometers. However, this distance was reduced to 2 kilometers in the new EPPS (2006), which are being complied by almost every school in Rwanda. MinEduc's expansion and rehabilitation of existing schools is seen as a viable way to quickly solve the accessibility issue. However, this led to overcrowding of classrooms and inconducive classroom environment. In typology studies, diminishing the demarcation of formality is believed to assist in cognitive transition and student autonomy. Modern construction methods were used to build most of the schools, with locally sourced materials. Although convenient, the materials tend to have low durability due to the dynamic climate conditions of Rwanda. Tangible problems like noise, water leakage, and maintenance can be improved with better construction details and more durable materials.

Classroom overcrowd is a main challenge in Rwandan schools with rising enrollment rate. Although higher enrollment means an improvement in accessibility to education, it is an irony when the infrastructure cannot keep up with the numbers. This often resulted in school expansion and rehabilitation projects to be designed in a simplistic way, sufficiently fulfilling only the minimum requirements. Schools in rural Rwanda are highly dependent on natural lighting as there is limited access to electricity by operating off-grid. *Tronc commun* schools require electricity as they accommodate facilities such a computer and science laboratories that make part of the secondary school curriculum. Based on the case studies, elements promoting cognitive stimulation are found to be gradually increasing. Although lessons are conducted in the conventional practice of 'frontal teaching' approach by teachers, alternative learning methods are possible inside or outside of classroom as students obtained an increased sense of autonomy.

Rwanda possesses promising potential in elevating its whole education system to achieve greater heights through innovation in knowledge dissemination and infrastructure provision, both in theory and practice, and enhance its future aspirations. As fellow stakeholders, parents and community involvement is important in establishing the idea of school as a safe, comfortable and beneficial place for their children (concept of participation and exchanging ideas). In case



studies visited, the Parents-Teachers Association (PTA) played a big part in financial management but lacks critical input on establishing the physical settings of learning environments as such limitation is imposed by the school or government. Schools should encourage inclusivity to gain better perspective in identifying challenges and solutions. Collaboration with local and international non-governmental agencies also helped the government to speed up its recovery process. Taking advantage of their expertise and financial aid, Rwanda was able to establish a long-term relationship in cooperation through partnerships in international missions on the global platform. In turn, this positively affects the country's global reputation and progress toward socio-economic development.

Consistent with its vision for knowledge-based economy, Rwanda is currently moving towards the quality improvement of education seeing that it does affect the labour market and future national economic stature. One way of achieving this goal is through efforts made in establishing a more viable educational infrastructure programs to produce better learning environments in schools.

However, most of these objectives are still quite implausible based on the unfavourable conditions most schools are currently in due to several factors. Priority remains in accommodating the vastly growing number of students, thus compromising the qualitative traits of school and limiting their potentials of providing an effective learning experience. Simplistic and non-holistic implementation of intervention is another factor. Physical and curricular interventions should consider the dynamism of future circumstances as a preparedness measure of anticipating radical changes and/or challenges.

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