UNIVERSITY OF KWAZULU-NATAL ™

INYUVESI YAKWAZULU-NATALI

The Influence of The Community on The Architecture of Learning Spaces: The Rethink of a Rural Primary School

by

Neeshailin Sutheeva Naicker 214549196

Supervisor

Dr. Yashaen Luckan

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DECLARATION

I hereby declare that this document is my unaided work. It is for submission to the School of Built Environment and Development Studies, University of KwaZulu-Natal, Durban, in partial fulfilment of the requirements for the degree of Master of Architecture. It has not been submitted before, for any degree or examination, at any other educational institution.

Neeshailin Sutheeva Naicker

Date

09 January 2021

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I, Neeshailin Sutheeva Naicker declare that,

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Signed

DEDICATION

An essential dedication would be to thank God for providing me with this opportunity to undertake my Master of Architecture.

This dissertation is dedicated to my loving parents Cheeky Naicker and Shireen Naicker. They have been there to support me physically, emotionally, and financially. The values, ethics, and principles, you 'all have instilled in me has help to shape me into the man I have become. Without you 'all, this achievement would not have been a success. From the bottom of my heart, I would like to thank you.

Thank you, Mum and Dad

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ABSTRACT

South Africa continues to face a skills paradox whereby there are extreme shortages of skills and high unemployment rates. It is argued that, in addition to weak government policies, poor finance, segregation, corruption and rapid population growth, the design of schools has actually inhibited the potentiality of education, especially in rural contexts. This study focuses on the influence of community in the learning space design of rural primary schools. This includes an inquiry into the role of architecture in alternative pedagogies and education for sustainability. The literature review, in the form of educational, social, and architectural theories, interrogate the possibilities of enhancing the teaching and learning environment through experience of place. Existing primary schools in Rural KZN do not take advantage of the power of the collective and place-based knowledge systems. The research defines the principles for a spatial rethink of a rural primary school in rural KZN that aims to extend the conventional learning experience beyond the confines of constructed classroom spaces to the broader context of learning in place. The research problem and questions required a mixed approach a qualitative study critically reviewed theoretical and conceptual positions in the context of this socially related research, while quantitative research included interview schedules and questionnaires.

This study is focused on what architectural contribution can be made to existing learning environments by integrating community influence within primary schools. In pursuit of quality education in rural communities, alternative methods of teaching and learning that use the community influence is explored.

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1.1 Introduction

1.1.1 Background

'The history of the South African democratic struggle realized the demise of Apartheid and the ultimate defeat of unfair practices, promised freedom, transformation and development for all citizens. However, 25 years into a democracy, that struggle continues for a large part of the population. Rural communities in South Africa face various struggles such as poor service delivery, unemployment, spatial challenges, education, a division between classes, social exclusion etc. In rural communities, the rules of engagement differ from their urban counterparts. 'Communities in rural areas also suffer from sub-par education, eventually leading to unemployment and negative economic growth in its spatial context. Social gathering spaces in rural areas are generally located at schools, which act as quasi-community centres. This raises a critical question: how can the rural school enhance the socio-economic sustainability of rural communities?' (Pillay& Luckan, 2019; pp01).

The learning process is a way of acquiring new skills, behaviours, values, and knowledge. Human beings start learning before birth and continue to learn throughout their lifetime by interacting with people, the environment, educational resources, and all things living, or dead. Learning can also occur in different states of awareness, consciously or unconsciously through the auditory, kinaesthetic, or visual transfer of knowledge. The first form of learning identified by many professionals in the field of education is through interactive play. ''Rural areas, unlike their urban counterparts operate in a different style,

one can argue that the day-to-day needs differ. In rural communities, access to basic services and infrastructure is a struggle leading to a downward spiral of its micro-economy. However, rural communities are resilient and creative methods of living are often adopted. Numerous ideas are conceptualized in rural areas, making it a powerhouse of innovation' (Pillay& Luckan, 2019; pp01). The experimenting, engaging, and studying of human beings at a young age. It has also been proved to be successful in adult learning, creating one of the essential ingredients in the learning, investigation and learning of children (Ole Fredrik Lillemyr,2009).

The history of education in South Africa has identified insecurity among select communities, whose consequences are still evident in society today. Apart from the well-known impact of Apartheid on education, more recent initiatives have focussed on increasing the quantity of education received by individuals. This relates not only to the number of individuals being educated but also for how many years. This process of rapid growth has improved the quantity of education in terms of the amount of society that is educated and for how many years (Crouch and Vinjevold, 2006). du Plesisis (2014) notes that 'Rural areas are marked by numerous variables that have a negative effect on quality education delivery. Rural areas are usually remote and largely underdeveloped. As a result, many rural communities, and their schools, which lack basic infrastructure for sanitation, water, transport infrastructure, electricity, and information and communication technologies, are poor and disadvantaged. The socio-economic realities of rural areas place learners at a disadvantage in rural schools (du Plessis, 2014).

The constitution (South Africa 1996) and the legislation on the South African Schools (South Africa 1996) and various policy papers note that the same level of teaching and studying, fair services and equal opportunities for education should be available among all South African pupils. But that's not the case yet. Many of the challenges have a direct impact on schooling levels available to

children in rural communities, in conjunction with socio-economic concerns like poverty and unemployment.

In particular, the spatial design of rural schools has not been considered properly despite the multiple transformation measures, since they are based on traditional architecture model that are not place nor community specific.

1.1.1.1 Motivation

A school makes a community, it is the binding element that keeps the community together. Malhoit (2005:10), elucidates:

> *"The school is the most important public institution in a rural community, a rallying point for services to poor families and children, a polling place, the library, and the community centre. Rural schools also represent the economic lifeblood of the community."*

The Bantu Education system, characterized by very weak school infrastructure, which did not favor positive learning environments, is one of Apartheid's most authoritarian legacies. In fact, children still receive the same schooling conditions in the majority of public schools, particularly in rural areas (News24, 2018).

Low socio-economic status characterized by inadequate infrastructure, crime and lack of official schooling distinguishes rural communities. There are great distances, and connections are poor; there is virtually no public transit, and private transport costs are high, even minibus taxis. Matika (2018) elaborates, the fact that so many rural schools are in such an appalling condition highlights the difference between them and most urban schools. Parents and children in a metropolitan environment will be much more likely to use their rights and ways and resources to convey the message to the DBE to ensure that any form of action takes place. Campaigns should be undertaken in metropolitan schools to make the DBE conscious of their concerns, which is also not seen in rural areas.

The author, through personal observation of rural schools in his own local community of Tugela and the surrounding areas, noted serious poverty, poor education facilities coupled with contextually unresponsive architecture, and a lack of integration of schools and the surrounding community. The purpose of this study stems from the challenges and problems currently surrounding the rural education in South Africa and is motivated by the notion of the built environment empowering education in order to enhance its role in the empowerment of individuals and of society.

From an architectural perspective, the author is motivated by exploring the vital relationship between communities, education, and the built environment to contribute to the resolution of this problem through architecture.

Existing rural education facilities in South African are built mainly to be introverted institutions that do not realize how culture and the community may have the ability to learn and vice versa. The rural community education system can develop capacity and expertise in rural communities, to help them make educated decisions about their farms, to innovate in agricultural matters and to make them self-sufficient and richly culturally expressive. 'Education also exposes the masses to information and helps prevent the misinterpretation of information' (Sajjad, 2019).

It is therefore argued that a much more considered architectural approach, that responds not only to the pedagogic needs of the students but also to the social-economic and community empowerment, is a major asset to the holistic sustainability of rural communities.

The outcomes of this research, is therefore, not only relevant to expand on the knowledge existing on the subject but also to investigate what the role of architecture is in contributing to the development of an empowered society in the built environment.

1.2. Definition of The Problem, Aims and Objectives

1.2.1 Definition of problem

The general state of rural education facilities has a negative effect on the overall standard of education that can be provided. Research suggests, rural community has an impact on learning spaces, however this impact has not been implemented architecturally in rural schools, in order to create an empowered education as a catalyst for the spatial transformation of rural communities in South Africa.

Wallin and Reimer report that rural schools are frequently impacted by educational issues, including (a) distance from professional facilities; (b) restricted access to qualified staff, growth and university services. The conditions in rural schools are frequently ignored as reports are done on school district problems. Rural schools also do not form part of education improvement programmes, across all school systems. While the 1996 South African Schools Act calls for the establishment of schools and students on an equal footing, in rural South African communities there are major historical gaps that cannot be overcome overnight. Rural schools' spatial planning is critically deficient in rural school improvement programs.

1.2.2 Purpose Statement (Aim)

The aim of this research was to interrogate how architecture and the built form, can enhance rural education and the surrounding communities and help them create a self-sufficient community, by studying the influence community has on learning space in rural areas, in order to develop a set of architectural principles for contextually responsive design of rural primary schools.

1.2.2.1 Objectives

In order to inform how this general purpose should be achieved, the aim of the study can be split into several individual objectives. Consequently, the objectives are:

- To research the current state of rural schools to understand the shortcomings of the architectural design of rural primary schools.
- Research the rural community needs to inform a responsive architectural strategy for rural primary schools and how they are used.
- To understand how architecture can enhance the social relevance of rural primary schools and create a self-sufficient community.
- To understand how the built environment can respond to the pedagogic requirements of a rural primary school and community.
- To develop a set of architectural principles for the sustainable development of community-responsive rural primary schools.

1. 3. Setting Out the Scope

1.3.1 Delimitation of Research Problem

To be able to represent society accurately, architecture must consider the needs of the people and thus their processes for reacting to these needs (Carmona and Tiesdell, 2007: 217). This research is mostly contained in the architectural sector and would use peripheral areas as support and explanation for argument, such as pedagogy, psychology, and social studies. Although the research concerns itself with the built environment, the focus will remain on architecture and its role in specific rural contexts, aligned with the current drive towards sustainability. Environmental, social, and economic strategies will be studied in the context of the influence of the community on the architecture of learning spaces in rural primary schools.

The theories and concepts, such as experiential learning and place-based learning, are delimited within the field of architecture. In order to provide relevant literature to rural primary school architecture, the theories of architecture have been established.

1.3.1.1 Definition of Terms

- **Built Environment**: A man-made ecosystem that involves natural features, open spaces and buildings or structures. The environment
- **Curriculum:** In education a curriculum is commonly defined as the entire experience of the student during the instructional process. It also simply refers to a scheduled teaching series or a view of the experience of the pupil with respect to the teacher or school's instructional purposes.

- **Education:** The method of teaching and studying to impart and gain wisdom.

- **Pedagogy:** 'Pedagogy, most understood as the approach to teaching, refers to the theory and practice of learning, and how this process influences, and is influenced by, the social, political and psychological development of learners' (Wikipedia, 2020).

- **Rural Area**: Land with a low population density and remote villages outside cities and towns (urban areas).

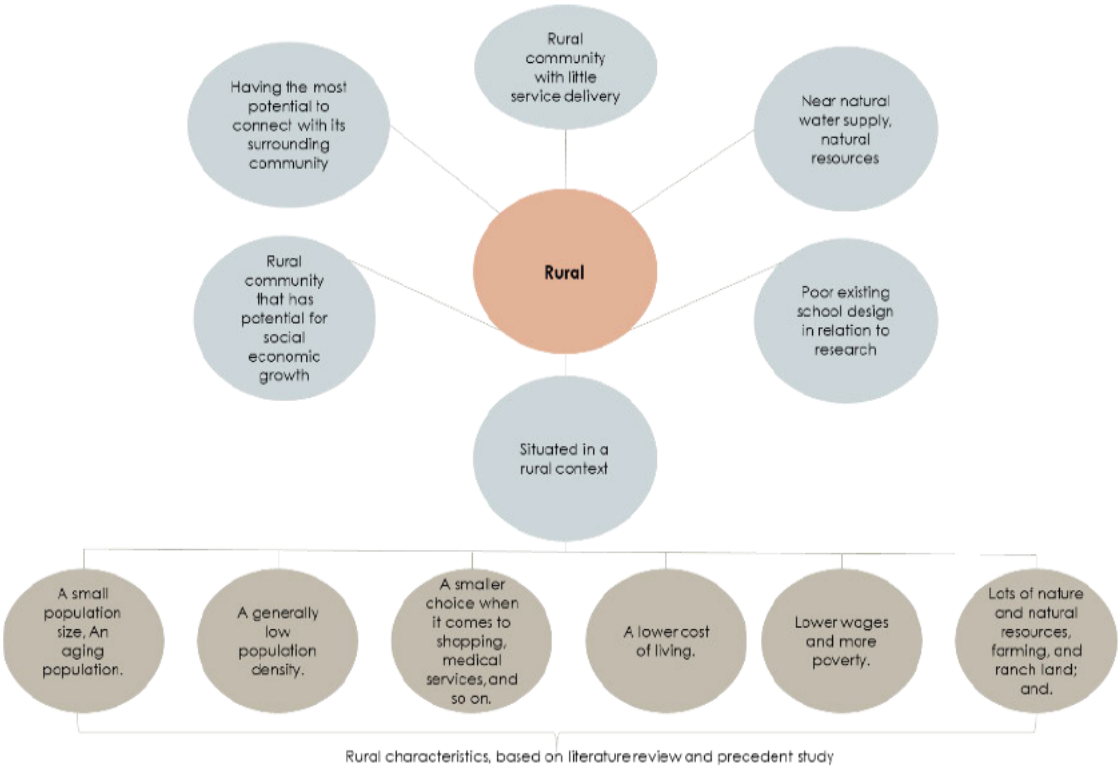


Figure 1.1: Rural Characteristics, Source: Author

1.3.2 Stating the Assumptions

The primary data obtained by observation, questionnaires and interviews can be believed to be conducted in a way that is true and in the best possible way. It can be assumed that the quality of primary schools' environment will continue to decrease as per the current statistics, which motivates the need for such a study. In the greater context of the study, the rethink of the curriculum, pedagogy and learning space development are intrinsically connected.

1.3.3 Key Questions

Primary Question

1. How can the built form respond to the pedagogic and spatial requirements of a rural community and primary school?

Secondary Questions

1. What is the current state of rural schools to understand the shortcomings of the architectural design of rural primary schools?
2. What are the rural community needs required to inform a responsive architectural strategy for rural primary schools?
3. How can architecture enhance the social relevance of rural primary schools and create a self-sufficient community?
4. How can the built environment respond to the pedagogic requirements of rural primary schools?
5. What set of architectural principles required for the sustainable development of community-responsive rural primary schools.

1.3.4 Hypothesis

The re-conceptualisation of the architecture of rural primary schools has the potential to empower rural communities through place-responsive learning environments.

1.4. Concepts and Theories

In line with the themes of the dissertation, concepts and theories are discussed. They are necessary to comprehend the meaning of the subject and its concepts. The theories and principles chosen to provide an overview of their effect on rural Primary School architecture learning space creation in communities. Experiential learning theory and phenomenology of place are theories which emphasize the importance of spatial learning during the design process.

This section introduces the theories and concepts that deepen the inquiry through literature review. The key question of this study as previously stated, aims to determine how the community contributes towards improving the teaching and learning environment within rural primary schools in South Africa. The data discussed in the literature review will be further synthesized in order to answer the key question, find gaps in the literature and to form the theoretical framework for conducting empirical research and for informing the design of a proposed rural primary school.

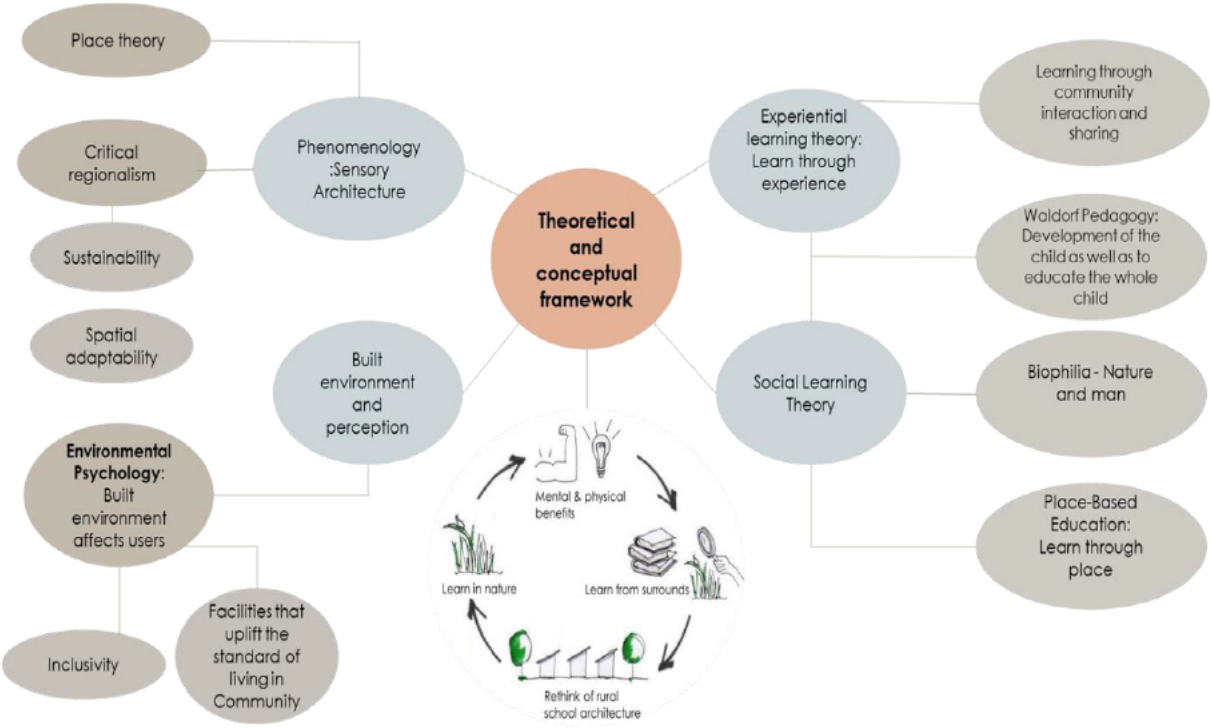


Figure 1.2: Breakdown of theories and concepts, Source: Author

1.4.1 Phenomenology (Paradigm)

The nature and meaning of the phenomena (including objects, people, events, and time) is seen by experience. The study of architectural phenomenology explicitly looks at the forms in which the form constructed can be interpreted dramatically and linked through first-person experience in rural primary schools. The importance of sensory perception and the physical dialogue that humans have with the real world is emphasized in order to convey meaning through architecture. Heidegger's 'dwelling' theories considered that humans comprehend the universe by 'inhabiting their environment and adapting emotionally to it,' and technology may be blame for obscuring this perception of the real world.

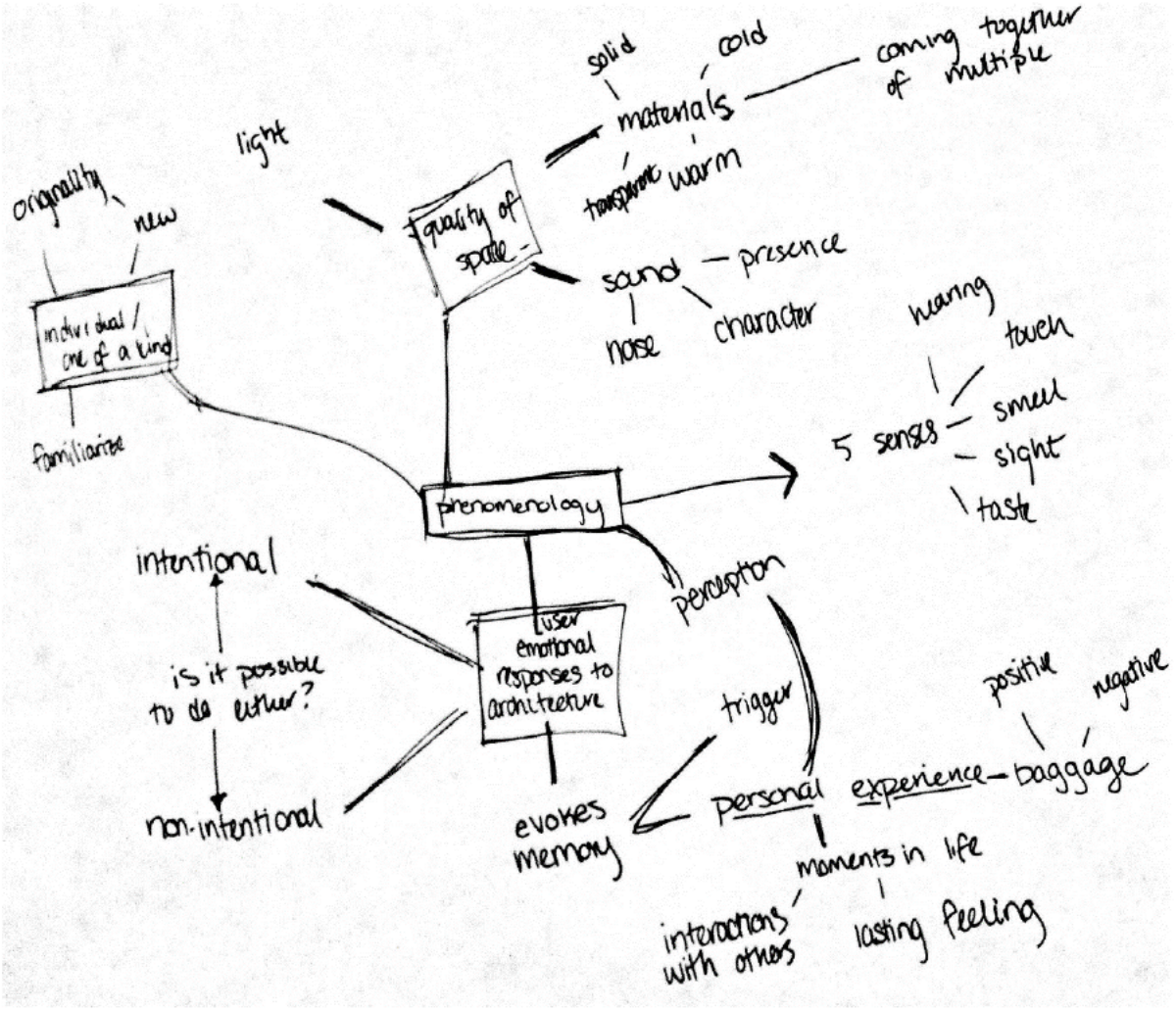


Figure 1.3: Phenomenology, Architecture, people and interactions, Source: (https://stavroulabirmbas.files.wordpress.com)

Place Theory

Sense of place is a theory that delves into an environment's feelings of belonging; it also involves the emotional connection between person and place, developed through knowledge of a particular area, recognition of elements in space, memories and experience (Relph, 1984: 5, Woods, 2009). Some psychologists believe this phenomenon can take time while others, like Relph, argued that sense of place has three stages, Familiarity: people experience their relationship with space only via activities paying little attention to place itself, ordinary familiarity: this stage is perceived unconsciously, it is more collective and cultural rather than personal at this level people tend to contribute to social activities and profound familiarity: this stage involves the essential integration of a person with themselves as well as with place (Relph, 1984: 5). Creation of a cohesive environment would require all three levels as having a sense of place encourages involvement in social activities and help people create bonds with place as well as other people (Steele, 2000).

According to Lynch (1981), Genius loci can be simply described as the "genius of place". It is used to describe a space which can be easily remembered for both its physical (architectural) and spiritual experiences. Lynch (1981:132), further describes these spaces as "good-spaces" which make use of all the human senses. Trancik (1986), states that when one understands the contextual and cultural characteristics of a space, well-designed spaces are achieved as well as an emphasis on the character of the space, which promotes a unique spirit of place. According to Trancik (1986), the use of this theory will help create spaces that can be totally experienced by people. An exploration into the various role's architecture play in people's lives as well as the psychological effects of the two will enable the creation of a built form which not only is pleasing to the eye but evokes an emotional response from users and help relay the "story" of the important influence communities have on the architecture of learning spaces in rural primary schools.

Figure 1.4: What Makes A Successful Place, Source: (https://assets-global.website-files.com)

This section deals specifically within the aim of improving the perception of the learning space development which is a direct link to place theory. This theory suggests that individuals perceive the world only insofar as it appears to us in 'structured wholes' or patterns, as opposed to random sequences of data which the brain later interprets. This will allow for an understanding of perception as an entity before focussing on the integrative mechanic of perception. Kofi Annan, the former secretary-general of the United Nations, once said that knowledge is power, and that information is liberating. In this case, primary schools directly contribute to a child's adolescent stage and to improving socio-economic conditions in South Africa, and it is the knowledge of this that should liberate the education of any pre-existing perceptions that oppose this process and undermine from its role in achieving this. Perception is a 'continually unfolding temporal process of interaction between an embodied subject and a surrounding world of objects in which we are inevitably enmeshed' (Ots, 2011: 167). This statement shows that a person's perception is an integrative experience between the body and the built environment.

This helps one to understand how space and sites connect and fit into spatial structures of the context. Additional hypotheses of the physical relations are analysed, in which a principle of flurry of borders, which further promotes incorporation and understands the formulation of a learning group, may be integrated into the context. This will form the basis to foster interconnected

interactions between a body and the built world that affect people's understanding, causing a shift in the thinking of rural people on what a school should be and the essential role that education plays in the betterment of their lives.

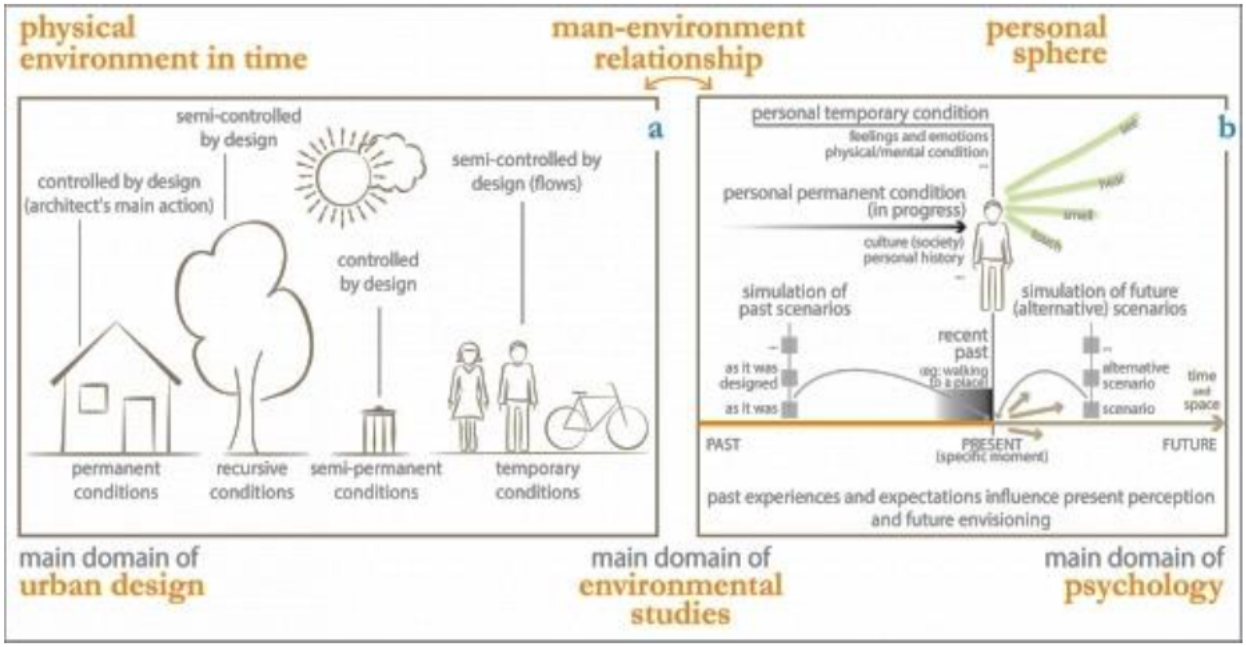


Figure 1.5: Environmental design studies on perception and simulation, *Source: (https://journals.openedition.org/ambiances/docannexe/image/647/img-3-small580.jpg)*

1.4.2 Experiential learning theory

David Kolb (2005) explored the philosophy of experiential learning and uses experience as a learning basis. As contrasted with more traditional approaches, where teachers are the only information providers in a classroom, experiential learning philosophy encourages learners to gain insight from their own experiences (Kolb, 2005). For this analysis, experiential learning is based in the real environment. As an extension of this hypothesis the concept of biophilia has been debated. Biophilia theory is defined as a human's innate propensity to interact with natural environments and processes (Kellert et al, 2008). It can be converted into architecture by building spaces with the natural world that are important for experiential learning. The way human beings function depends on the world around them. The natural world will also affect

the functioning of humans, as people communicate with nature (Kaplan & Kaplan, 1989).

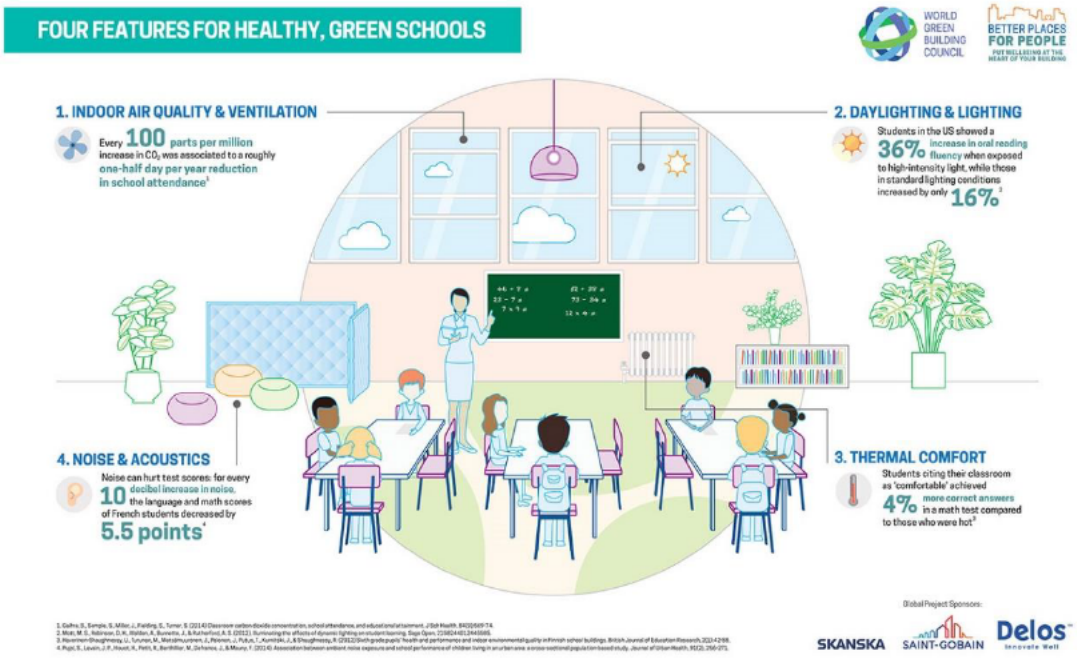


Figure: 1.6 Schools are often under-maintained. "School" is a place a child has to go, no matter the indoor environmental conditions. And young children are impacted by indoor environmental factors, like poor air quality, more than adults. We must make a school environmental health for children in order to help them thrive.

Place-Based Education: This definition is a branch of the experiential learning theory. The social meaning and history are used by the community-oriented school as a basis for information. For this theory the concept of 'place' is particularly important, since it forms the foundation for schooling. 'This concept may be associated with architectural theories of the School as a Microcity, Researching Street or Public Squares by Herman Hertzberger (2008). The book Spatial and Learning (2008) by Hertzberger deals with these concepts and their use in architecture.

In conceptualizing the design of rural primary schools, the study of these ideas and hypotheses and the values drawn from them will elucidate, not only reacting to the teaching needs of rural primary schools but also shaping the structures of education spaces and public- private gradient/interfaces in rural primary schools.

In the end, rural schools have a tremendous opportunity to engage people with information. This dissertation argues that this spatial relationship requires different pedagogic approaches. It is therefore that inclusive learning theories, such as social learning, and the nuanced traditions of place-making through architecture become intrinsically connected.

1.4.3 Social Learning Theory

As Bandura postulates, the social learning theory says that individuals learn by watching, imitating and doing (Bandura, 1977). This theory covers incentive elements, as hypothesized by Maslow; nevertheless, Bandura claimed that the social variable produced mutual determinism, because people saw the consequences of the behaviour of some people. Social learning explains human behaviour, mutual activity and context effects as a continuous cognitive theory. Passion and drive are essential; without them students cannot learn to their fullest ability and, when brains are active, invention and imagination are simpler. This was further elaborated by Bandura in the social cognitive theory, which further added that the personal values of the learner often affect the learning process that produces complex connections between personal influences, environmental factors and human behaviour.
This is important because an education process that displays successful outcomes for individuals directly influences the motivation for others to learn. Similarly, the opposite is true, whereby unsuccessful outcomes leads to a lack of motivation to learn. Therefore, creating architecture that responds to the pedagogic requirements of rural schools will aid teaching and learning and provide motivation for the community to learn. Social learning theory also suggests a relationship between the learning space and surrounding context in order to create contextually responsive rural architecture. This relationship can be looked at in the form of people(community), nature, materials, culture, and day to day experiences, which could be enhanced by the investigation the theory of critical regionalism.

1.4.4 Critical regionalism

For a learning facility to thrive in rural areas, it must integrate with the existing rural fabric and have strong links to existing surrounding areas. The critical regionalism of Kenneth Frampton examines the modern architecture's connection to the current context. The goal is to construct meaningful spaces and buildings in connection with modern technologies and their geographical contexts. It speaks of architects taking a critical consideration and understanding of local conditions including climate, physical and structural elements in the landscape and quality of light. It seeks regional appropriateness in a local context. The approach of various post modernists to culture as a resource for creating an identity, is criticized by Kenneth Frampton. Critical Regionalism argues that architects should look beyond just regional appropriateness of the local architecture. There should be a consideration of local qualities such as the landscape and light quality specific to the site, creating local appropriateness. Critical Regionalism can then be considered as an alternative to local-based approaches to identity.

1.5. Research Methods and Materials

1.5.1 Introduction

The aim of this thesis is to see how the community affect the architecture of rural primary schools in rural South Africa for children's education and development. This section of the dissertation deals with the approach, the primary and the secondary data collection that is used to gather pertinent data on the scope of the thesis based on how the environment affects rural primary school architecture. The research was performed using qualitative methods of research, primary data derived from the evaluation of interviews and from questionnaires as well as secondary data from the quantitative analysis. The technique explored first of all the role of architecture and the definition of place-based education by reviewing the literature on place

making and environmental behaviour, as well as educational research on spaces for children.

Due to the COVID-19 pandemic the author has recruited participants for interviews and questionnaires through the following ways: Remote Interviews which include, telephone interview, skype or google hangouts and Remote Questionnaires which include telephone calls or via E-mail. The author has also interviewed specific individuals from desktop study of site and gatekeepers, If I can get into contact with them, during this time. Now that lockdown as moved to stage 1, it can be possible to meet face to face if the participant agrees. Due to the COVID-19 pandemic it was not possible to do case studies, meaning going to designated places physically, however the author chose to do desktop study of site of a school, that is tied to the research and analyse work that was done previously.

1.5.2 Research Philosophy and Strategy

Pragmatism defines the research philosophy of this study. Pragmatism is relevant to this research as it draws on the socially focused interpretation of experiences (interpretivism) as well as the scientific numerical data analysis of space and building (positivism). The aim of this study as stated is to explore how the influence of the community on the architecture of learning spaces in rural primary schools. In this regard, both quantitative and qualitative research is necessary. Quantitative research in the form of questionnaires and observation are a useful specifically for the teachers and community members as they are high in number and this is an appropriate method to use to extract information efficiently. This data has also identified key themes and relationships among variables in order to make assumptions based on numerical data. These assumptions may then inform the qualitative research which is in the form of focussed interviews with executive personnel such as the members involved in the design of the learning facilities, the heads of schools and communities, and the members responsible for the policies that define the design community spaces and schools.

1.5.3 Secondary Date Collection

Secondary data was collected in order to form a general understanding around the research question and a boarder perspective can be applied to the design of a rural primary school for rural South Africa. Secondary study requires a systematic literature review and will analyse all literature and precedent studies on the research topic, both local and international. For the final design hypotheses and solutions, the data obtained is used along with the data synthesis. Secondary sources of data include numerous journals, including books, newspaper posts, documents on internet websites, papers and research papers.

The literature topics of focus will encircle:

- Influence of Apartheid on education in South Africa;
- The influence of the community on rural school architecture
- Place theory and the importance in space development architecture and;
- Space development in built form.
- How can the built form respond to the pedagogic requirements of rural primary schools?

Precedent study:

Precedent studies provided a macro approach and response to the problem statement. The precedent discussed the current built environment and how suitable places of learning are created. Despite the final findings from the previous research, this analysis helped to explain how rural schools elucidate the user's framework. The precedents offered an insight into ideas and design standards around the issue of the community's impact on the architecture in educational spaces in rural primary schools and a rethinking of the typology.

1.5.4 Primary Data Collection

Primary data was be collected in order to allow for the testing of a working hypothesis. Due to the COVID-19 pandemic the author has recruited participants for interviews and questionnaires through the following ways:

Remote Interviews which include, telephone interview, skype or google hangouts and Remote Questionnaires which include telephone calls or via E-mail. The author has also interviewed specific individuals from desktop study of site and gatekeepers, If I can get into contact with them, during this time. Now that lockdown as moved to stage 1, it can be possible to meet face to face if the participant agrees. Due to the COVID-19 pandemic it was not possible to do case studies, meaning going to designated places physically, however the author chose to do desktop study of site of a school, that is tied to the research and analyse work that was done previously. The key data addressed would be the desktop site survey of current primary schools in KZN, centred professional interviews, simple questionnaires for teachers and community members using the defined community in question. The approach would explore the role of architecture and the definition of place-based education through a study of literature on the making of place and the behaviour of environment and education research on children's spaces.

Questionnaires/ Interviews:

Questionnaires are used for collecting a wide range of knowledge on the basis of the participants' first-hand experiences. The issues would include curricula in rural primary schools and the effect of the culture on the design of the learning environment. In order to properly understand the research issue, detailed interviews will be performed. These interviews are to be held at KZN rural college.

Sampling

The study involves a range of questionnaires and interviews in and around the rural north coast that will help shed light on how schools can empower education and better the lives of rural residents. Therefore, according to the main questions listed in the context of this thesis, this sampling procedure will be set out in which different classes of people are chosen in the following categories:

- Local Parents of the children, to enquire what resources and infrastructure is needed.
  (3 Local Parents, Duration of 25mins)
- Local teachers, member and leaders of the community will be involved, in understanding what they feel is needed for them and the child's development.
  (2 Local Teachers, 2 members of the Community, Duration of 30mins)
- Local designers involved in projects relating to urban renewal designs and spatial
  designs in the rural context. (2 Local designers, Duration of 20mins)
- Architects involved in the designing of primary schools will be interviewed to understand
  the aim of the architectural response of this research proposal. (2 Architects, Duration of 20mins)

1.5.5 Research Materials

The research materials are used to obtain information from sources which are relevant to the study. These materials are listed below:

- Photographs, illustrations, and sketches of precedent studies will be used to gather information.
- Semi- structured interviews will be used to gather first-hand information from relevant participants; however, the questions will be left open-ended to allow for additional information to be provided.
- Secondary sources or materials such as published literature, reports, documents, conferences and thesis's will be used.
- Questionnaires will be used to obtain broader and summarised information compared to that of the interview questions encompassing learning space development.

1.5.6 Research Analysed

The study was carried out with qualitative methods of research, primary data from interviews and questionnaires and secondary data from conceptual analysis and literature review. Review of a range of relevant policies, and research documents from the Government to establish the position of Architecture in the learning space childhood development Sector of South Africa. Thematic, discourse, descriptive and textual analysis is used for the data collection. Images, text/ narrative and illustrations are used to represent data, data analysis and concepts. The purpose of this analysis was to establish how International and National decision makers consider the relationship between community and learning space architecture in order to create a new model of rural school architecture. The key questions are responded to, through the literature review, precedents, case studies and primary data collection.

1.5.7 Summary (Matrix Table)

Objectives	Research Question	Data Sources	Sample size	Data Collection Methods	Data Analysis Method	Data Presentation Forms and Style
Research the rural community needs to inform a responsive architectural design of rural primary schools.	What are the community needs to improve the lives of rural communities?	Published Literature	20	Document/ data study from libraries and online resources	Thematic and Textual analysis	Text/ narrative and illustrations/ images
To understand the learning and resource needs of rural communities.	What are the learning and resource needs of rural communities?	key informants and published literature	4	key informants and collect secondary and primary data	Thematic and textual analysis, discourse analysis	Themes, images, text/ narrative, illustrations
To understand how architecture can enhance the social relevance of rural primary schools.	How does architecture enhance the social relevance of rural primary schools.?	Literature, case study/ observation and precedent study	4	Collection of data, precedent and case study investigation	Discourse analysis, thematic analysis, observation of case study	Images, text/ narrative, illustrations
To understand how the built environment can respond to the pedagogic requirements of rural primary	How does the built environment respond to the pedagogic requirements of rural primary schools?	Published documents, journals, magazines, case study	10	Document analysis, collection of data from relevant sources, interviews	Document analysis, observation of case study/ descriptive and discourse analysis	Text/images, narrative, drawings, illustrations, maps
Develop a set of architectural principles for a responsive design of rural primary schools.	What architectural principles must be used for a responsive design of a rural primary school?	Published documents, journals, magazines, case study	5	Document analysis, collection of data from sources, interviews	Observation of case study/ descriptive and discourse analysis	Text/images, narrative, drawings, illustrations, maps

1.6 Conclusion

The author has addressed the context and the inspiration to examine the problem of study in this introductory chapter and identified the research problem, its objectives and aims and the scope for the analysis to include limits, meanings of words, main hypotheses. Concepts and theories related to the problem of analysis have been developed and the techniques and resources used to collect, structure and interpret data have been recognized. Each chapter helps to decide and to plan the thesis' course so that an informed method can simply and accurately be established, reminding the above chapters so that a short and position can be developed for a proposed rehabilitation of rural elementary schools in Kwa-Zulu Natal.

Chapter 02 –The influence of the current rural education system on the architecture of learning spaces.

2.1 Introduction

South Africa was subjected to extreme racial discrimination until 1994 under the apartheid regime. The focal point of this chapter will be to discuss the effect on rural education systems and architecture that the apartheid era had, and still has in creating a rethink of a rural primary school, knowing these effects is important.

The rural schooling system and architecture has hardly changed over the last 26 years. Research shows that government has made little advancements in changing the way rural education is perceived. Could the influence of community on the architecture of rural schools be the missing asset being overlooked by the government? In this chapter the author will attempt to the existing rural schooling system and investigate how the interplay of community and architecture can be used to move rural schooling and communities forward.

In addition, 25 years since the conclusion of apartheid, the South African Government is now seeking to reverse the effects on rural education systems. This chapter aims is to investigate how the interplay between architecture and the influence of the rural community, can aid in this.

2.2 The influence of Apartheid on the architecture of rural schools

In the early 1990s, a large number of researches has been carried out since the transition to democracy in order to recognize and explain diverse problems and difficulties in rural education. While government, businesses and civil society are keen to address these problems and are serious about their role in the resolution, the element of rural school architecture and community influence has been largely ignored. The author found that when visiting rural

schools, the practice of studying under a tree remains very prevalent. While this reflects a severe shortage of facilities and basic education requirements, there is also a neglected opportunity to cause the link between the indoor and outdoor areas. Rural schools have remained constructed as one rectangular building or a cluster of one or two buildings which do not respond in any way to geographical, pedagogical, or social requirements. Rurals schools are almost forgotten, left to fend for themselves, however these schools have the potential to advance the place-based curriculum, through spatial transformation, to respond to the rural communities.

At a functional / utilitarian level, there are also practical challenges with regard to the provision of facilities such as libraries, computer rooms and science laboratories, that are supposed to be available in each school. These programs are most lacking in rural schools and children with no access to them are successfully taught at a lower standard. Some schools do not even have athletic facilities that can be included in the learning process or exceptional experiences like art and drama. 'It is thus clear that the level of education received in the rural areas is generally inferior to that in urban areas, largely due to the relative lack of facilities and infrastructure available in these schools' (Matika, 2018).

Existing rural schooling facilities in South Africa are primarily built to have introverted institutions that neglect the potential community, and the environment may have on learning outcomes and vice versa to develop the community's awareness and skills.

Research suggests incorporating the current rural fabric and have a good interaction with existing surroundings and community desires with an educational institution that thrives in rural areas, which is significantly lacking in the existing rural school system. The critical regionalism of Kenneth Frampton looks at the relationship between modern architecture and the current context. The emphasis is on developing concrete areas and systems through

the link between new technologies and their spatial contexts. It talks about architects who take a critical view of local circumstances, including climate, physical and structural elements in the landscape and light quality into account. In a particular context it seeks geographic suitability. This research aims to advance the philosophy of critical regionalism to incorporate the social, economic, and cultural facets of place as a critical background response.

This suggests that interplay between the surrounding rural community and the learning space architecture, is directly linked to the quality of education of not only the learners, but also the community. However, for this interplay to grow and develop into a responsive architectural system, evidence shows that's adequate financial input is needed. Since the fall of apartheid, schools are still deprived of funding, equipment, and trained teachers. Under these circumstances, efficiency, effectiveness, and continuity of education are extremely unthinkable (Ramdass, 2002: 14). Many children attend under resourced schools who have shown that they have an impact on the achievement of those children. Public schools in rural areas are graded according to many reasons, which have a negative impact on the provision of decent education. Rural areas are usually remote and mostly underdeveloped, water, highways, transport, power, and information and communication technology lack the requisite physical services and the required sanitation facilities for many schools. The low socio-economic condition of children in rural areas is troublesome for learners. Because of budgetary limitations, provincial governments cannot provide rural schools with the required financial assistance to help give students better education. In addition, educational authorities are unable to provide much-needed physical and human resources to schools, placing a heavy burden on parents who are forced to provide their children with essentials such as food, stationery, and cleaning supplies. Parents often do menial work in rural South Africa, have a lower level of education, and generally do not attach much importance to

schooling. As such, these parents cannot afford additional items needed by teachers, which in these schools have a negative effect on teaching and learning.

In public schools across the world, however, architects may help alleviate the effects of food insecurity. Architects will better serve all students and help them achieve their academic objectives by using school architecture design to counter food insecurity in rural schools.

Focusing on food security in rural areas not only enhances the lives of the students, but also the community members. It makes the community as a whole self-sufficient and draws on the sustainability principles.

Following the years prior to apartheid, government has strived to implement strategies to improve the situation in rural schools, one of the key strategies is implementing feeding schemes to reduce food insecurity. The impact of food scarcity on education in South Africa is partially discussed through the government's National School Nutrition Policy (NSNP). The NSNP, the school meal where dinner is served all days of school, the balanced education that helps protect students and the lifestyles of school classes, and the school food garden which encourages food generation are three main practicalities. Three are fundamental activities. Therefor this aid from the government suggests a key role in helping change the quality of education and the lives of the community. However, evidence suggests that the existing built form does little to support the implementation of these practices. The interplay between, community influences and knowledge on the architectural design of these spaces suggests that, these spaces efficiency and relevance could be greatly improved and in turn aid in the community to be more self-sufficient and improve the social economic growth.

Students who do not have the ability to take their own meals at home or buy food in the cafeteria in the rural South Africa environment. Free or low-cost food is available to the government. However, schools will need to have a

place where students can pick up their food for these initiatives to be successful (HMC Architects,2019).

The biggest advantage of making the dining hall more welcoming is that it allows learners to feel less isolated from their peers. Like their fellow students, the school district or college may provide them with meal tickets or prepaid cards that they can use to purchase food from the front desk (HMC Architects,2019).

Here are a few design features that make students facing food insecurity even more inviting to dining halls:

Using the template of a Marché. It is impossible to provide students a range of food if you have just a portion counter. A model from Marché includes several smaller food stations across the room, with a large seating area in the centre (HMC Architects,2019).

Demonstrate the food being prepared and cooked. Any students who have difficulty with nutrition don't know how to prepare or cook food at home. By bringing in the kitchen, students will watch how the food is prepared by demonstrating it and by example (HMC Architects,2019).

Create gardens in the community. You may also create community food gardens in and around the school through the design of landscaping architecture (HMC Architects,2019).

In schools, meals have many benefits related to education. They would stimulate enrolment in school, increase attendance, minimize short-term starvation, and enhance university performance and concentration (HMC Architects,2019). While interacting in these community gardens children would be exposed to experience, they would normally to get in the classroom. The research suggests that these chance community/learner experiences will aid in proving learning through of skills needed in the rural context, which are vital

life lessons needed. In the opinion of the author, architecture that responds to this is key in achieving this form of experiential learning.

Figure 2.3 – Rural education facilities, Source: https://bucket.mg.co.za/wp-media/2019/03/1effe0b2-00-rich-school-poor-school-the-great-divide-persists.jpeg

The author explains the principle of experiential learning as a significant factor in raising rural South Africa's education level. Experiential learning focuses on the premise that getting experiences is really the best way to understand things. Those interactions then stand out in your mind and help you recall facts and retain details. In comparison to more conventional approaches, in which teachers are the primary sources of information in a classroom setting, it encourages learners to acquire knowledge based on their own experiences. This is vital in a rural context as resources are not readily available and learners can all learn from the interactions of the local members and community.

Figure 2.4- The divide between education institutions, Source: data:image/jpeg

Figure – 2.5, 2.6 Difference in standard of education facilities in 2020, Source Figure – 2.5 https://containerworld.co.za/wp-content/uploads/2016/03/Learning-Under-A-tree.jpg Figure – 2.6 1https://s3-sa-east-1.amazonaws.com/nova-website-sa/sa/wp-content/uploads/2019/06/09151848/DSC08457-386x217.jpg

2.3 Conclusion

To conclude, the author has found that there are numerous issues that need urgent attention when analysing the current condition of the rural education system in the South African education system. This chapter shows the need to improve the standard of rural education and the lives of the population in order to resolve the existing challenges that the apartheid period is posing to physically implanted populations.

The role of the architects is constrained, namely, to establish the designed building environments with conditions that facilitate and encourage teaching for teachers and learners in a certain measure (Peters, 2016).

Architecture has the power to aid in the improvement in the for mentioned problems, by creating well designed facilities and spaces, that not only will improve the standard of education, but also the surround community.

Chapter 03 –Place theory and place-based education in the rural schooling context.

3.1 Introduction

This chapter includes an overview of research using place theory and place-based instruction to use common teaching and learning methods. The human-place relation is first explored in this chapter as a framework for relating the educational-built form to rural communities. This is discussed with respect to its origins and the deteriorating relationship between humans and nature. The value of history is discussed, and the importance of learning experiences is discussed. Once the value of linking rural school architecture with the community is identified, schools are placed as the centre of communication promotion with children and the community. The Finally, specific sensory elements of design are discussed in relation community, in order to create varied sensory experiences for the learners of the school.

3.2 Why placed based education in rural schools?

An urgent concern that leads to the classifying of a rural region is the scarcity of facilities and resources in rural areas. The region suffers not only from hardship, but also a lack of social stability, because of a lack of resources and facilities. Place based education draws on the support of the surrounding context and focuses on the link between people and place, thus investigating the influence of community on the architecture of rural schools, in the view of the author, could be seen as a vital factor in changing the perception of the way place viewed in the rural context.

In the school-built environment, using constructed spaces enables learners to "experience school" as a metaphor for "being in the world" (Hertzberger cited in Faiferri, 2012). Hertzberger (2008) notes that the "interpreter of an individual's educational needs" can become school-built environments (Hertzberger cited

in Faiferri, 2012). It allows students and the other users in the room to contact the room. Hertzberger (2008) notes in his space architecture that less restricted classroom units and corridors as instructional spaces improve the possibilities of learning.

Place-Based Education (PBE) is an instructional technique that uses geography to create real, meaningful, and customized learning for students. 'Local education' is characterized as an integrated learning experience in a place-based learning centre that provides students with the cultural, landscape, opportunities and experiences of local heritage and uses them as the basis for studying language arts, mathematics, social sciences, science and other topics in the curriculum. This approach could be most beneficial in a rural setting as there are little resources available to these communities, the approach forces these communities and schools to utilize their resources in the most efficient way, that uplifts the standard of education and surrounding community. At the same time with the implementation of technology, responsive architectural design and improved facilities in the rural school, research suggests that, it will not only uplift the quality of education but also surrounding community.

South Africa's rural populations face a range of difficulties including inadequate service delivery, unemployment, space barriers, schooling, class separation, social isolation etc. The rules of engagement in rural societies vary from those of their urban counterparts. Rural populations also suffer from under-education, which inevitably leads to unemployment and economic development in rural areas

Place-based education "a teaching and learning approach that links education with the local community," and "break barriers between schools and their communities" (Smith and Sobel, 2010). PBE will transcend alienation from the environments of classrooms, mutual partners, and the natural climate, by anchoring learning in its place (Rae rote, Schröder and D'augustino, 2015).

Figure – 3.1 Goals of PBE, Source :(WHAT IS PLACE-BASED EDUCATION AND WHY DOES IT MATTER?, 2017)

3.3 Place-based education, place, and sense of place as a catalyst for community involvement in rural learning spaces.

Until recently studies have been undertaken in education on the perceptions and relations people create towards their places of birth and education and the role these areas perform in their lives (Ontong and Le Grange, 2015). In a rural community learning is not done only in the classroom, learning is done through experiences of day to day living and how one interacts with specify places. Therefore, the architecture needs to create provisions for these interactions to take place. According to (Ardoin, 2006), PBE originated from an emotional plea by educators to reconnect to the land, to become rooted and to care for places. She further points out that the notion of place is very seldom approached as a multidimensional and holistic concept. PBE can enable teachers first to widen their awareness of the meaning of place and, second, to become mindful of the sense of place of their learners.

'A sense of place is an extension of the building type, and it's the job of the designer to identify and develop what's needed for the demographic that is going to occupy it. It means creating adaptable and flexible spaces that best support the activity the building is meant to host, but it also means looking at the whole site for possibilities in reinforcing the message trying to be

sent with the architecture.' (Creating a Sense of Place Through Architecture and Design | Thought Leadership | HMC Architects, n.d.)

The development of a 'sense of place 'means the establishment in Architecture of a relationship between (architectural) built spaces and their location and the way these spaces may have a positive effect on their users. This indicates that rural areas are closely regarded, Architecture creates rooms for people to understand, embrace and experience relaxing according to Norberg-Schulz (1980). Christopher Day expands on how spaces should be rendered to places in his book Spirit & Location (2002) (Figure 12). and these issues are converted into resources and influences for an architectural solution to be acceptable. This research often considers the natural world as a location for developing a sense of place.

According to Norberg-Schulz (1980), Architecture creates spaces through which people understand, accept, and feel relaxed. Christopher Day, in his book Spirit & Place (2002), expands on how spaces can be made into places (Figure 12).

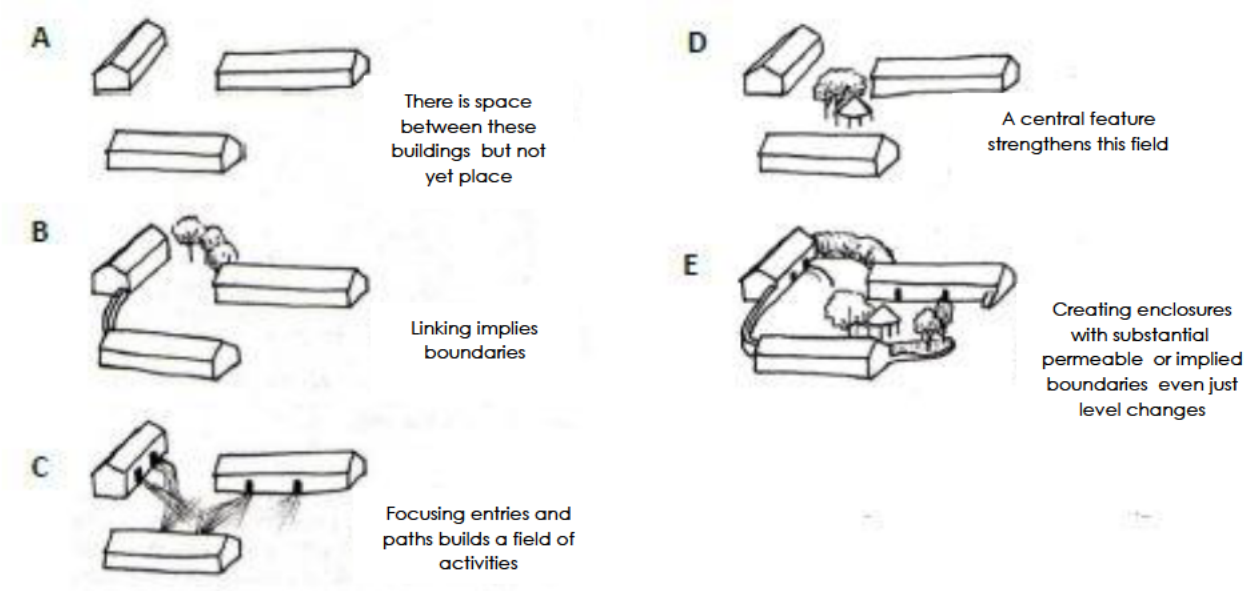


Figure 3.2 - Making Space into Place, Source – Day (2002)

Day (2002) expresses the notion that form, and space contribute to the shaping of a person or community at social and individual level, in addition to promoting and cultivating development. The way we respond to our environment is based on a connection which is deeper than preference. To create a sense of place for its users, when preparing the designed form for a particular site, the architects must take into account the characteristics of the area such as air quality, son, colour, shape and temperature. The relationship between the community and architecture could be seen as another level whereby, the architecture needs to respond. Evidence suggests the community are a wealth of knowledge, which could strengthen the overall sense of place.

The biophilistic definition of places is described by Kellert (2008) as the way in which architecture is able to communicate with the location it is formed. This is achieved through recognizing how a landscape is an architectural kind or how the construction that catches the character of a location in the history of space, ecology, or cultural history Righini (2000) explains in line with Kellert how the meaning of place was important to man's survival in ancient days as it was based on a good moral, physical, and psychological survival. Research suggests that this relation between the man and place is historically present in the rural context, however due to the hardships faced by rural communities and lack of support, the built form fails to harness this potential. A Pallasmaa (1986) quote on phenomenology explains the big issue in some areas, which is closely connected with the lines of reasoning between Kellert and Righini, which triggers more people' s emotions than elsewhere. Pallasmaa questions:

Why can our emotions attract few modern houses, while almost every anonymous house in an ancient city or the most unpretentious farmhouse offers us a feeling of familiarity and pleasure? - Pallasmaa (1986:428) Places fewer are used for characterizing the unrelated architecture of some relation to its location or users with regard to meaningful position. Edward Relph uses local phenomenology to explain the relation between people and place in his

novel Place and Place of Lessness (1976). Relph (1976), by naming three variables, analyzes an individual's identity:

- the physical settings of the place,
- the activities, situations or events of that place,
- the experiences and intentions of people in that place.

Place lessness, should be avoided as it evokes alienation and strangeness within a person.

3.4 Conclusion

Finally, place-based learning uses 'place' as the basis of learning and instruction. The created and natural ecosystems (as places) become an integral part and must be designed appropriately of the education experience. In designing built and natural habitats, the role of architects in place-oriented education is obvious. This aims to strengthen the learning process by creating a bond between the learner and the position of deliberate thought.

The user experience in the areas of this field fosters a sense of location such that the school atmosphere can achieve the importance of students within it by constructing it to deter fewer. Herman Hertzbergers texts on school architecture are explored in order to clarify how students should view spaces and elements positively, offering a more concrete interpretation within the school setting.

The writings of Herman Hertzberger was used for this analysis as the key basis for the design of the school's building features.

Chapter 04 - Community influence on the architecture of rural schools

4.1 Introduction

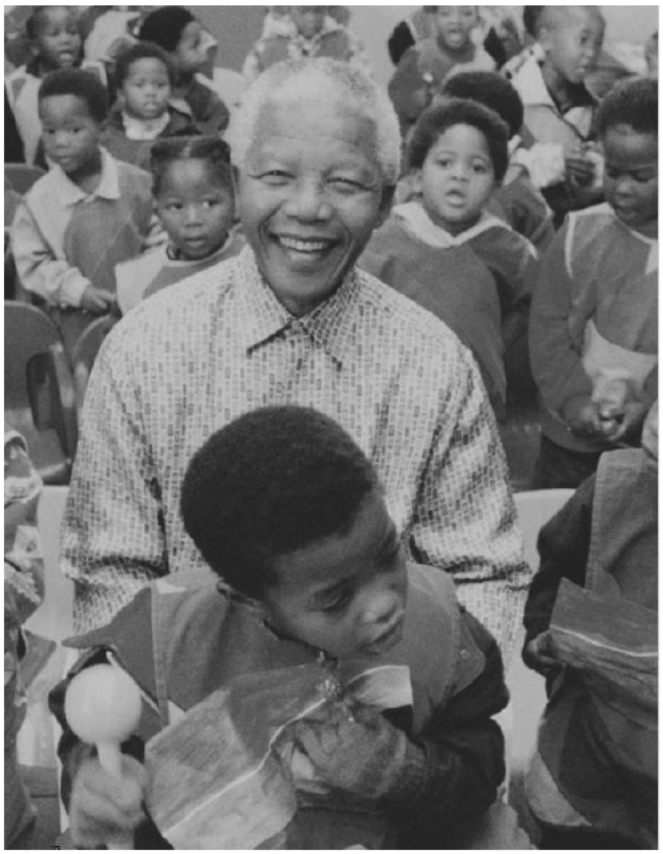


Figure – 4.1 Nelson Mandela embracing the children, Source: (Nelson Mandela Foundation, HSRC Press, 2005)

'I have often said that the most profound challenges to South Africa's development and democracy can be found in its rural hinterlands. These areas, systematically and intentionally deprived of the most basic resources under Apartheid, continue to lag behind the rest of the country in the post-apartheid era. Foremost among the challenges facing rural South Africa is the task of improving the quality of education. What is often overlooked, however, is the immense, untapped potential of rural communities to take the lead in shaping a better future for themselves. We have to work together to ensure that decision-makers targeting poverty alleviation and social development have access to the voices of the very people who are supposed to benefit from these policies.' *Nelson R. Mandela*(Nelson Mandela Foundation, HSRC Press, 2005)

The quality of education is argued to be inherently associated with learning space quality. The current reality of rural sub-par schooling has a negative

effect on the population, eventually leading to unemployment and a negative spatial growth. The rural school's spatial architecture continues, however, to be characterized by standard typologies which do not reflect the complexities and the effect of rural communities on school, thus compromising rural schools' socio-economic sustainability. 'Social gathering spaces in rural areas are generally located at schools, which act as quasi community centres. This raises a critical question: how can the rural school enhance the socio-economic sustainability of rural communities?' (Pillay, & Luckan, 2019; pp01).

This chapter examines various literature sources to understand spatial programmes of rural schools, and factors influencing community economic and social sustainable development. The chapter will also investigate the community influence on the architecture of rural schools, identifying the community and pedagogic needs of the community. 'Community schools' in this context refers to those types of educational facilities which in one way or another depart from the traditional pattern of serving a particular age group for a limited part of the day, the week and the year and for one specific purpose, i.e., 'education', but instead providing meaningful and responsive architecture, not only to improve the standard of education of students, but to provide facilities, for the empowerment of rural communities.

4.2 What is the relationship between schools and communities in rural areas?

It should be a given that relationship between rural school and the community, should be a strong one. However, research gathered so far has proven otherwise. There are many causes to this almost non-existent relationship, but evidence suggests that one of the major factors are a serious lack in contextually responsive architectural facilities. Buildings are mostly erected in isolation to what the communities need, with no consideration to context or the people.

'Researchers have studied how to begin by considering their key concerns and priorities before debating schooling itself in order to discuss substantive

conversations with people from rural communities on educational issues' (Gardiner, 2017). The explanation is that there is a significant shortage of sensitive architectural facilities that cope with hunger, jobs, water access difficulties and energy forms, mobility challenges and the lack of public services. Education is seen as part of all other basic activities and people are very much informed of the power of families, children and teachers. This is something to which the author can relate, as the people he meets every day in his local community of Tugela have shown a keen understanding of how socio-economic circumstances impact learning and education.

Furthermore, the Department of Education also understands that developing rural schooling can go beyond "fixing up colleges." The need to work together to address the challenges needs to be addressed as part of a successful holistic solution to poverty and sustainable growth and to encourage social harmony.

In 2005, the Nelson Mandela Foundation released a study on education in rural communities in South Africa that prioritized the poorest regions of the homelands of the former Eastern Cape, the KwaZulu-Natal, and the Limpopo. In addition to the statistical details obtained for this report, the opinions (the "voices") of citizens in nine communities were collected. Parents, educators, teachers, neighbourhood leaders and traditional healers were involved. In one case. The study explored rural poverty from the lens of education and shows how enthusiastic parents ought to make sure that both boys and girls have the best chance of better education and to strongly expose the conditions of education in rural areas. Researchers have identified issues in the relationship between community members and colleges. For e.g., children have to do certain household duties in the early morning and in the afternoon. These activities challenge the plans and schedules of the classroom. In comparison, many children go starving to school and cannot concentrate.

'Collaborators from the CEPD and from Fort Hare and the Witwatersrand Universities have shown how small schools rely on the multiple sources of knowledge and resources available in any group, regardless of how poorly they are' (Gardiner, 2017). In rural villages there are also well-registered young people who cannot continue training and have no employment, unemployed graduates, and pensioners without paid jobs. There are specialist writers, musicians, dancers, scholars, cultural interpreters, and people educated in conventional forms of knowledge, all of whom can teach schools and their students a wealth of education, as the current model of schools is not suitable for this. Rural regions also have material capital that can support local schools in order to create a difference between schools and neighbourhoods, but schools with this income are not very advantageous only outside the school fence.

To put schools and communities far closer together is very necessary. For both schools and community members, this is a dynamic and daunting undertaking. One reason it should take place, however, is that it provides a key connection between education and development and to understand their spatial needs.

4.3 Identifying the spatial and pedagogic needs of rural communities

Rural sustainable development is focused on socio-economic, political and physical development of rural areas (Jiwane and Sanyal, 2013). This suggests that such development depends on community, society, economy, health, education, technology and the built environment. In terms of their psychology, expertise, intelligence, mindset, and other abilities, it requires the creation and empowerment of human capital. Without the provision of basic infrastructure and facilities, including drinking water, electricity, education, transport, etc., development cannot take place. It is important to figure out the role of local level institutions and restructure their role to promote the growth goals in order to encourage growth.

'Educating communities means developing schools and educating children and leaders. By doing so, rural communities will be led to healthier and more sustainable future' (Sajjad, 2019). The inability to deliver basic services impacts all facets of community life, including daily lives, classrooms, hospitals and leisure activity. The shortage of basic resources in the city impacts schools and affects everyone's access to education and quality of education.

'The definition of rural still eludes us because the term is ambiguous and the distinction with urban tend to be arbitrary, thus no concrete definition has been agreed upon' (du Plessis, 2014). It should be remembered that South Africa has a number of rural areas, the researcher points out, and thus certain social, economic, educational and cultural factors need to be addressed in strengthening rural education definitions.

The following factors are examples of the rural profile (UNESCO, 2005):

- Distance to towns;
- Topography, (conditions of roads, bridges to school, etc);
- Access to information technology;
- Transport infrastructure (roads, buses, taxis);
- Access to services and facilities (electricity, water, sanitation);
- The health , educational and economic status of the community;
- Access to lifelong learning services;
- Social conditions in the community;
- Activities of political and civil society organisation.

In the article 'Redefining the Role of Architects in the Rural Development', the authors, Anamika Vishal Jiwane and A. J. Sanyal, unpack the role of architects in the rural context, the authors clarify that what rural areas require is not only support, but architectural (visual and topological) technological skills. Proper utilities must be addressed with a site and service strategy in order to achieve successful performance. 'The visually sensitive people (architects) can be given a chance to act as catalysts with the community during their design

process' (Jiwane and Sanyal, 2013). The researcher believes that, with the active involvement of the community, architecture has the responsibility and power to efficiently facilitate the implementation of the seriously lacking facilities needed by the rural communities.

There is a fundamental continuity between the lack of basic services in schools and in the community – water, roads, electricity, and sanitation are in poor supply in schools because they are in poor supply in the environment. Lack of basic services in the community affects schooling and impacts on the access to and quality of schooling. Infrastructure in the community and at school is high on the list of priorities of all participants. (Nelson Mandela Foundation, HSRC Press, 2005). It constitutes a particular social need in communities.

4.3.1 The spatial significance of a rural school

A school makes a community, it is the binding element that keeps the community together. Malhoit (2005, pp.10) elucidates:

> *"The school is the most important public institution in a rural community, a rallying point for services to poor families and children, a polling place, the library, and the community centre. Rural schools also represent the economic lifeblood of the community" (* Malhoit, 2005, pp.10).

Schools are as much an aspect of rural development as they are a symbol of development (Nelson Mandela Foundation, HSRC Press, 2005).

Communities see the provision of school infrastructure as integral to the improvement of schooling and education. Across all research sites communities focused on the lack of basic infrastructure: water, electricity, roads, clinics, quality schools and community halls. These constitute the 'practical social' needs of communities. Schools are used for a range of purposes other than schooling. They are vital as community resources for the further education of adults.

School as micro-city

According to Herman Hertzberger (2008), a micro-cities school can be contrasted to schools where the elements of the architecture of the school are compared with the city's components. This allows each part of a school-built setting to be viewed as interlinked components of a completed whole, much like a community structure. Each element is able to elicit the user of that element in these emotions and reactions. 'Learning Streets' and 'public squares' As the Micro-City School, should represent the world within its boundaries (Hertzberger, 2008). Throughout the school-built environment can take place a large number of social experiences and observations. A school representing a microcity connects with the community that surrounds it, since it no longer behaves like an individual building, but is built to behave in the same way as the inhabitants, by establishing mutual bonds and connections between them.

4.4 How can architecture enhance the social relevance of rural primary schools and create a self-sufficient community.

The author will touch upon the issue of spatial justice in the South African sense in order to set the tone for this portion of the chapter.

'Our spatial environment is one of the most important determinants of our well-being and life chances. It relates to schools, opportunities, businesses, recreation and access to public services' (Wyk, 2015). Spatial disparity takes place as segregation impacts the spatial climate. Since Apartheid was the epitomised of the notion of space injustice in South Africa, space injustice is translated into space justice using tools and instruments. The usage of spatial justice principles is one of them. While the NDP decided that spatial planning should conform with the requirements for such normative values and explicitly explain how this should be accomplished.

Spatial Justice as defined above, relates to the unfair or unjust allocation of space. South Africa, like most countries has large amounts of spatial injustice. However, unlike other countries South Africa's spatial problems in the larger

cities occurred from the spatial policies of the apartheid government. This left the majority of people living out of the cities in demarcated zones (Pillay & Luckan, 2019; pp05). These areas lacked services, infrastructure and an overall absence of socio-economic drive. Lack of services and infrastructure in rural communities is a pressing issue, which is a contributing factor in classifying a rural area. Due to lack of services and infrastructure, the area suffers not only from poverty but also from the lack of social cohesion. A rural school can be seen as a quasi-community centre. Schools in rural areas play various roles. It can serve its primary function as a school or a secondary role as a library, clinic, adult education centre, function venue, voting station etc. It is a built place that facilitates various activities within a community (Pillay & Luckan, 2019; pp05).

The Department of Education has recently created policy taking into consideration the various roles a school plays, however the policy is silent on the design of school buildings. It is this silence that has motivated (Pillay & Luckan, 2019; pp08), to briefly recommend a few points on the design of schools. The principles of rural school design as quasi community centres are listed below:

- Flexible and adaptable space in school buildings.
- Defensible courtyards learning, convening and playing.
- Sustainable design towards Net-Zero status.
- Community gathering space such as a hall with pluralistic functioning.
- Community sports field and other sporting infrastructure.
- Library and Information centre, Dual use for students and community.
- Agricultural Training and spaces for growing crops – food security
- Workshops for skills training.
- Cultural spaces (Pillay & Luckan, 2019; pp08)

In the authors view, these spaces are essential to the socio-economic sustainability of rural communities. The authors posit that if a design thinking

method is employed, the rural school can truly be a place for sustainable community development.

Many different solutions have been tried. Often donors spend large amounts of money on what are considered to be low-cost and low-tech solutions for rural communities only to find that they become 'white elephants' (Nelson Mandela Foundation, HSRC Press, 2005).

4.4.1 The architect's role in the rethink of a rural primary school.

A holistic vision of the society, which incorporates the nature, culture and politics as well as industry, includes sustainable community growth. These problems are time-based and complex with multiple possible outcomes. The sustainability degree is, however, related to group events. All is responsible for shaping the society and its future through their own actions. That means that the person level begins to evolve. During a span of many decades, people live in the natural as well as in a specific society and is accepted as a benchmark for "sustainable community" in all cultures around the world (Barton, 2000; Pease, 1993), so that a sustainable community will never grow because members of community neglect the connection between man and community and between man and nature. The constructed atmosphere has an effect on any society in addition to man and nature.

The role of Architects in community development goes beyond designs, documentation, execution, or supervisions, Architects can provide an overview of issues related to the project or offer experience in a specialized field (Day, 2003). Because architects have the ability to understand the consequences of the design process (McCamant et al., 1994), and can think spatially (Day, 2003), they can advise and educate local people on any additions or improvements to their physical environment. Their knowledge and experiences can assist the community in their decisions and initiatives. Furthermore, because the community consists of many stakeholders, the actions of architects should not only be limited to the rich and powerful but

should also extend to ordinary people or even people with limited opportunities, such as low-income or homeless people. Meanwhile, the voluntary sector, in which citizens join together to undertake some particular task with no personal financial gain outside the government framework, can be an alternative client for architects to work with in the community (Wates & Knevitt, 1987). Although the practices of the architects refer mainly to social processes, the environmental concerns are the result of their actions, both the inputs and outputs from their operations and attitudes and the effects from their built environment. As a result, the actions of architects are primarily part of social structures, both in their position as residents and as practitioners. As in the first phase, architects will be able to share their know-how in the process of planning and execution. A third phase of assessment and analysis should be performed while preparation or other tasks are undertaken. Architects who serve in a task force can participate in the decision-making process and the choice of methods. They will compile, evaluate and display the data. The data from an assessment should give an example of how the whole process from the watching, preparing and performing to the evaluation should be analysed and used. Awareness of previous accomplishments will provide the group with confidence in new initiatives and inspire more members to engage in neighbourhood and group acts (ORTEE, 1994).

For architects, the relationships between humans, places, and individuals are central considerations. The impact of architects on community growth, however, depends on their position on it. Architects living in a society where no constructed environment is feasible must use built environments generated by other architects and can only have an impact as community residents.

4.5 How the built environment can respond to the pedagogic requirements of rural primary schools.

The rural community and the rural school sustainable development is based on their pedagogy, the growth of socio-economic, political, and physical living.

For this development should be used the key words of society, population, economics, health, education, technology, the environment, etc. The development and empowerment of human capital are important in terms of their psychology, knowledge, intelligence, attitudes and other capabilities. Evidence suggests that pedagogic development cannot take place without the provision of supportive learning space development, thus the interplay of community influence and the build form is key in realizing this development. In order to support growth, the position of local organizations should be strengthened, and the design restructured to adapt more contextually to facilitate development goals. 'Pedagogy, most understood as the approach to teaching, refers to the theory and practice of learning, and how this process influences, and is influenced by, the social, political, and psychological development of learners' (Wikipedia, 2020). Pedagogy is taken as an analytical discipline as a way to examine how knowledge and skills are expressed in an instructional context and to take note of experiences while study. The philosophy and practice of pedagogy vary significantly because they represent diverse socioeconomic, political, and cultural contexts.

The pedagogy that teachers follow shapes their actions, decisions, and other teaching methods by taking into account theories on learning, student understandings and needs and the perceptions and desires of those students. In rural communities, the community itself is seen as type of teacher, architecture need to respond to this dynamic to aid the pedagogical process. Its aims could range from the advancement of liberal education (general human development) to the narrowing of vocational training (provision and acquisition of specialized skills). The teacher is seen by traditional western pedagogies as information keeper and student as knowledge recipient (described by Paulo Freire as "banking methods" however, pedagogical philosophy gradually defines the student as an entity and the professor as a facilitator.

'The school environment provides one with opportunities to learn to respect others, follow instructions and rules, as well as explore and participate in activities around us' (Hertzberger cited in Faiferri, 2012). 'Learners at the primary school level develop their basic understanding of concepts such as morals and values, as well as develop personal experiences within the school environment by means of all their senses' (Palmer & Neal, 1994; Palmer, 1998). Themes such as grammar, numeracy and science should be learned in an experiential manner, which can be supported using the natural world and addressed by the community. Themes such as grammar, numeracy and science should be learned in an experiential manner, which can be supported using the natural world and addressed by the community. Davis (1998) believes the implementation of negotiated environmental standards of conduct at primary school level, thus promoting environmental awareness among children. Unfortunately, current school-built environments follow minimum requirements provided by officials that are not adopted into the culture. The possibilities for extending the learning environment have rarely been explored; but this can be altered by recognizing that learning is not confined to a classroom environment, as explored by Jilk (2005) who states, "…when we accept that learning is not limited to a classroom, we realise we can also learn in a closet, a café, or a cathedral" (Jilk, 2005:31).

In the view of the researcher, the importance of the built form responding to the pedagogic needs of rural schools, is imperative in upgrading the current state of the schooling system in rural areas, not only the quality of education but also the quality of the built form. Evidence suggests that government have ignore this key aspect in the rural schooling system, however responding to the pedagogic requirements will not only provide a more student-centred schooling system buts also a more architectural responsive school.

4.5.1 Waldorf Pedagogy as catalysis for creating a strengthened community/school relationship.

How can school architecture respond to the pedagogy that exists within it and help it? 'The Waldorf philosophy is one of the fastest growing educational movements in the world' (Jolley, 2010). However, for a Waldorf School in South Africa that caters to pedagogy, there is no existing architectural model. Pedagogy has clear views about how best to encourage the growth and architecture of the student may help to reinforce that approach. As a modern way of teaching children, Waldorf education was developed in the early Twentieth Century. The key concept behind its creation was to create a curriculum that coincided with the child's development as well as educating the whole child, the head, the heart, and the hand. The aim of educating the whole child is to awaken the secret abilities within each child that lie dormant, enabling them to see the power, intelligence, and excitement within themselves. The goal, according to Rudolf Steiner, the founder of Waldorf education, is to "develop free human beings who are capable of imparting their lives with intent and direction" (Lyons, 2003. Pg23). Waldorf education, as described earlier, is not about separate components, but about a holistic approach to education. The researcher claims that this pedagogical approach could be used to strengthen the existing rural education system, as it calls for the education of the child as a whole, by drawing up all the tools that the local community plays a large part in.

4.5.2 Principles of the pedagogy

The concepts of anthroposophical philosophy are based on Waldorf pedagogy. The holistic approach to human beings is one of the fundamental characteristics of the theory: emotions, imagination, spirit, and intellect are considered special to every person, and thoughts, feelings, and acts are often understood to be related.

The theory therefore focuses on developing people who are able to relate both to themselves and to society (interpersonal and intrapersonal

intelligence)-essential skills to resolve the challenges of the 21st century. "Such learning occurs in schools that comply with the Steiners method, bringing families into and into the community in their school environment," (Migliani, 2020), which can support South Africa's rural architecture framework.

4.5.2.1 Part to Whole Relationship: Head, Heart, & Hand

The curriculum in a Waldorf School is designed so that the students are engaged on more than one level. In the case of a rural context the influence of community, could go a long way in engaging this multi-level engagement. Literature suggests that the rural community is a bustling, lively ecosystem, that is rich in culture knowledge. Harnessing this energy through the built form suggests engagement of learners not only physical, but also mentally and emotionally. Rudolf Steiner found the children to be interested in schooling to be three basic powers. Mental, emotional and physical behaviours involve these powers, which are also times known as brain, heart and hand (Jolley, 2010). Students are believed to be more interested in learning by talking with the three powers and to be more strengthened and rewarding what they learn. Children are typically told to memorize and repeat details in conventional instruction to the instructor in any manner. 'The problem is that the head is so dependent, and the students get exhausted. The students can stay conscious by integrating movements using the heart and the hand (Jolley, 2010). The other characteristic of these forces is that they are naturally and unless they have been overlooked, they will come out of the pupils. For starters, if the children are sat on their desks for too long, the teacher will start to feel faithful and ready to walk about. 'The idea is to sort out your mind, heart and side, so that children tug less and have a rhythmical routine for every day' ' (Lyons, 2003. Pg19).

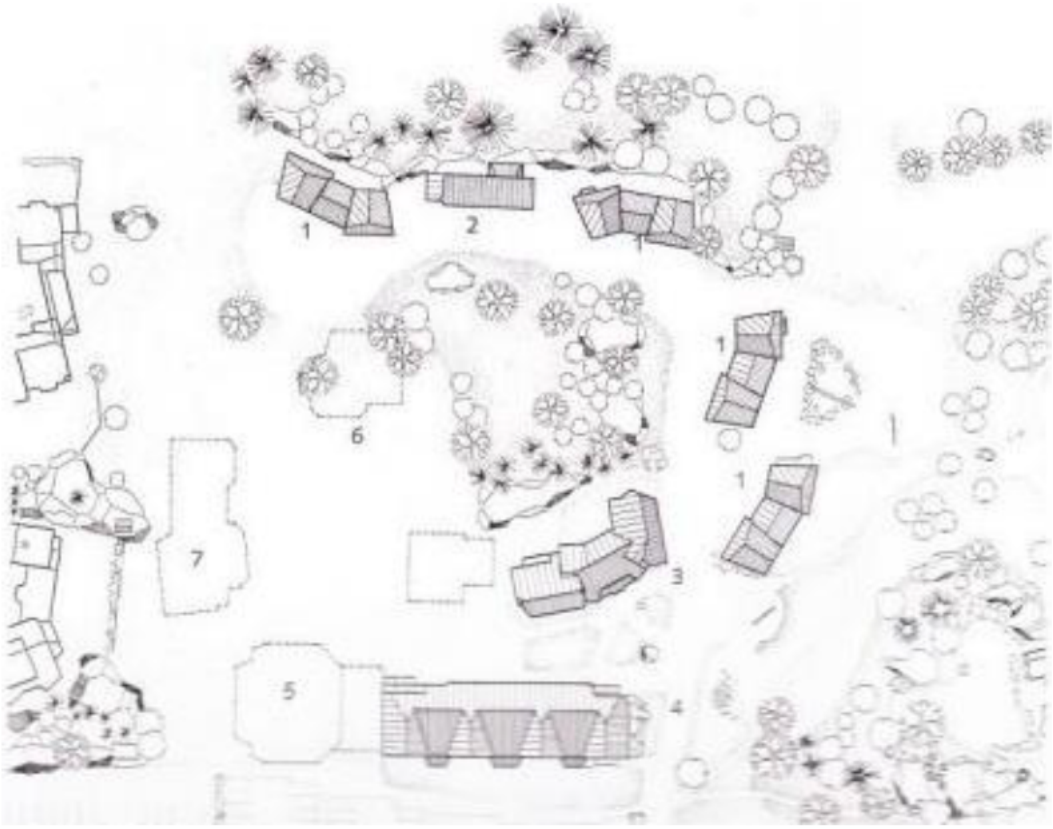


Figure 4.2 - Orjan School Site Plan, Source: (Coates, Gary. Erik Asmussen, Architect. Stockholm: Byggförlagte, 1997. 28)

Architectural response

"The classroom needs to have an open plan that permits the teacher to change and divide the space into different areas of activity" (Jolley, 2010). The versatility of a classroom space can be translated architecturally into the community influences spaces as well. The different practices are united within the whole of the classroom in this context. The same concept refers to the school as a whole and every room executes a particular purpose alone, but the whole building must be connected and integrated. The device should not be a mass of individual items, but a grouping of connected areas should be a single whole. In Figure 4.2, this primary Waldorf school is organized around a core unifying space, which is connected to each structure. Each region is distinctive, but still united, with the aid of traditional materials.

4.5.2.2 Classroom as Community

The research shows that's rural communities are tight knit groups of families that have been in that specific area for many years. The community feeds on the strengths of each other which lends itself to a strong support structure. This way of life could be a key influence in the architecture of a rural school. The party becomes its own society by having the same students and professors in the classroom. Children are so well known to each other that they know the qualities and shortcomings of each other. Consequently, where those circumstances arise, those of greater capacity will support less capable individuals. 'Students' bonds allow them to learn and grow together and give them a feeling of being able to depend on them (Jolley, 2010). This may be game-changing, as most children come from broken families in rural areas and the major contributor to social and poverty-related problems. 'Analogously, the teacher is an important source of authority that the children continually look for' (Jolley, 2010). The concept of a community is extended beyond each classroom and by the layout of each school. The Faculty exists as an egalitarian community and they share responsibility for the operation of the school. The members of the class are assisted by the framework of the academic structure and the structure of the physical school.

Architectural response

Every classroom must have some distinguishing features that differentiate it from other classrooms just like one class is not the same. This helps each class to have a different field that reflects the community character. Colour is one of the strongest ways to accomplish humanity. 'Pedagogy of Waldorf stresses the use of shades' (Migliani, 2020). For all ages a specific pallet is recommended according to the stage of sophistication of the infants. Younger classrooms often use warm and bright (especially red and orange) colours and are synonymous with active and festive events that are most typical to this age group in the day-to-day life. For medium-aged pupils, cold colours (blue and greenish) are advisable for tasks requiring greater attention and emphasis.

Figure 4.3 – Yellow train school, use of colour through the building, Source: https://images.adsttc.com/media/images/5e6f/c48b/b357/653d/d300/0355/slideshow/Yellow_Train_VivekM-1504.jpg?1584383106

Each classroom has a very different way of acquiring creativity, such that each classroom is not just a replica of the previous one. The Waldorf school plan where a central atrium can be arranged as seen in Figure 4.4. Each room has a specific arrangement, and each room has various sunlight properties due to its circular plan. Every classroom needs to be unique, but it should also be remembered that it must be a cohesive entity.

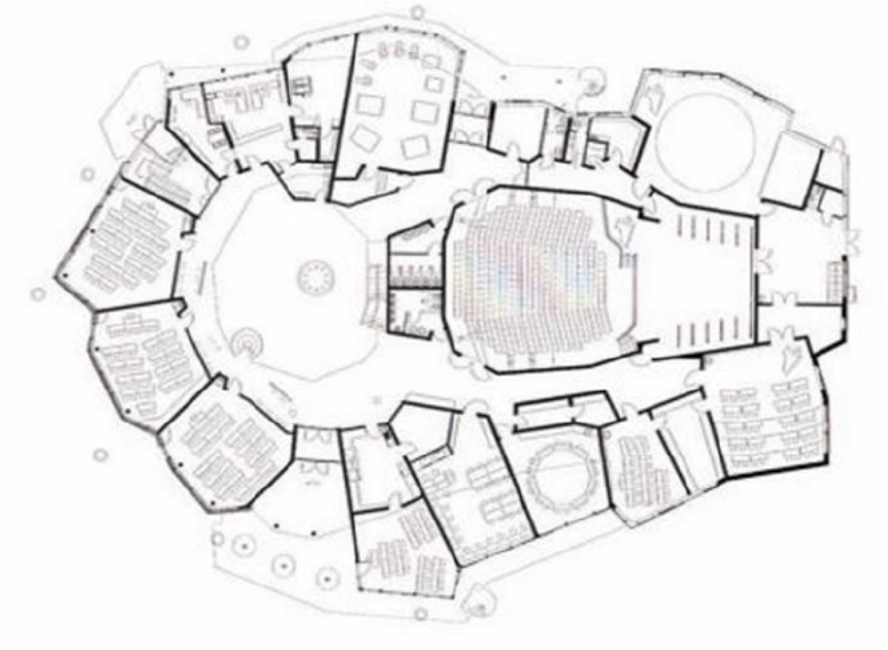


Figure 4.4 – Freie Waldorfschule Ground Floor Plan, Source: (Blundell, Jones Peter. Peter Hübner: Bauen Als Ein Socialer Prozess = Building as a Social Process. Stuttgart: Edition Axel Menges, 2007. 188)

4.5.2.3 Importance of Nature

'The connection (direct or indirect) with nature is considered highly beneficial for the psycho-emotional health of children and is often presented as the material for different school activities' (Migliani, 2020).

A very critical feature of Waldorf education is to get the kids interested and bond with nature. People are very distant from the natural world in many respects and lack real respect for what it provides and offers. 'It is much easier to teach children the importance of nature and the responsibilities humans have in maintaining it than it is to teach adults' (Jolley, 2010), the author goes on further to say that, In their own environment, children find it easier to relate to plants and animals and quickly pick up responsible environmental behaviours. Students need to become interested in their surroundings and realize how humans depend on raw materials in order to achieve a full understanding of nature. Much as plants are part of the human world, animals are also part of it. If learning about plants or animals, presenting pictures or video often stresses direct exposure. Nothing can really catch the true feeling of being a part of nature or mimic it.

By cultivating location-based relationships between outdoor spaces and students, outdoor spaces may contribute to building a sense of place within schools. In order to complement the teaching and learning process, this can be achieved by incorporating outdoor spaces with built form.

'Traditionally, natural spaces within schools took the form of sports fields with little vegetation as components of the school environment' (Higgins, 2006). Vegetated natural spaces can, however, be introduced to complement the teaching and learning process within school environments. As mentioned earlier, different benefits for learners were encouraged through the use of gardening within a school. Site connections are a central aspect in schools that facilitate environmental education. Primary school case studies studied by Palmer and Neal (1994) found that through their out-of-school interactions, learners not only gained knowledge and understanding, principles, abilities and attitudes, but also increased sensitivity and concern for living things in the world around them.

Types of gardens that can be introduced to reinforce the connection between nature and the learning environment within schools:

- Sensory Gardens may build even spaces in which all of the senses are evoked, a term consistent with Sensory Architecture. Sensory gardens involve water components and scented plants in order to create a peaceful atmosphere. The interest of children is created by water characteristics, drinking wells and small bodies of water that contain small fish and other aquatic life. This will be used to conserve water and promote the educational and learning environment, to 'cleanse and to realize the importance of water all in the school environment' (Tai et al, 2006).
- Edible Gardens – Gardens with edible plants provide a host of learning experiences. Learners know all about the process to preserve their lives and feed safely by incorporating children into principles of fresh fruit,

vegetables and edible herbs (Tai et al, 2006; Center for Ecoliteracy, 1997). 'The introduction of children to concepts of growing, harvesting and consuming fresh fruit, vegetables and edible herbs Ensures that students understand biodiversity concepts that in turn support the environment' (Center for Ecoliteracy, 1997). school gardening programs also allow students to connect with their communities because schools have vegetable gardens to give the community back (Tai et al, 2006). Water collection and storage can be provided inside the houses and for learning and teaching and thereby lead to a more environmentally sustainable architecture. Garden plots will be present in the whole school-built setting depending on the level of incorporation of the food-producing garden systems with the School, in classroom architecture as small areas and in the case of farming schools.

By integrating green spaces within the school-built Higgins 2006, elaborates how, the school ecosystem may become part of broader rural community greening initiatives that rely on community engagement to preserve green spaces in schools. This offers a greater incentive than curriculum-based subjects to teach learners more. The types of natural outdoor learning spaces used in learning environments should complement the constructed forms, since this plays a role in the understanding and usage of outdoor spaces and buildings within schools. A consistent learning and teaching atmosphere that promotes education and healthy development in all aspects of its designed environment will be created by the appropriate configuration and incorporation of built form and green spaces in schools.

Architectural response

Although many existing rural schooling facilities are situated in areas which are rich in natural vegetation, research shows that the existing school architecture does little to harness this key factor in improving rural pedagogy.

There are numerous ways of included the natural world in the design of a Waldorf school. Looking again at Orjan school, figure 4.5, a naturalized landscape is at the centre of the city, providing a meeting place and focal point for the school. The buildings are often surrounded by the natural world and the students are absorbed in their world.

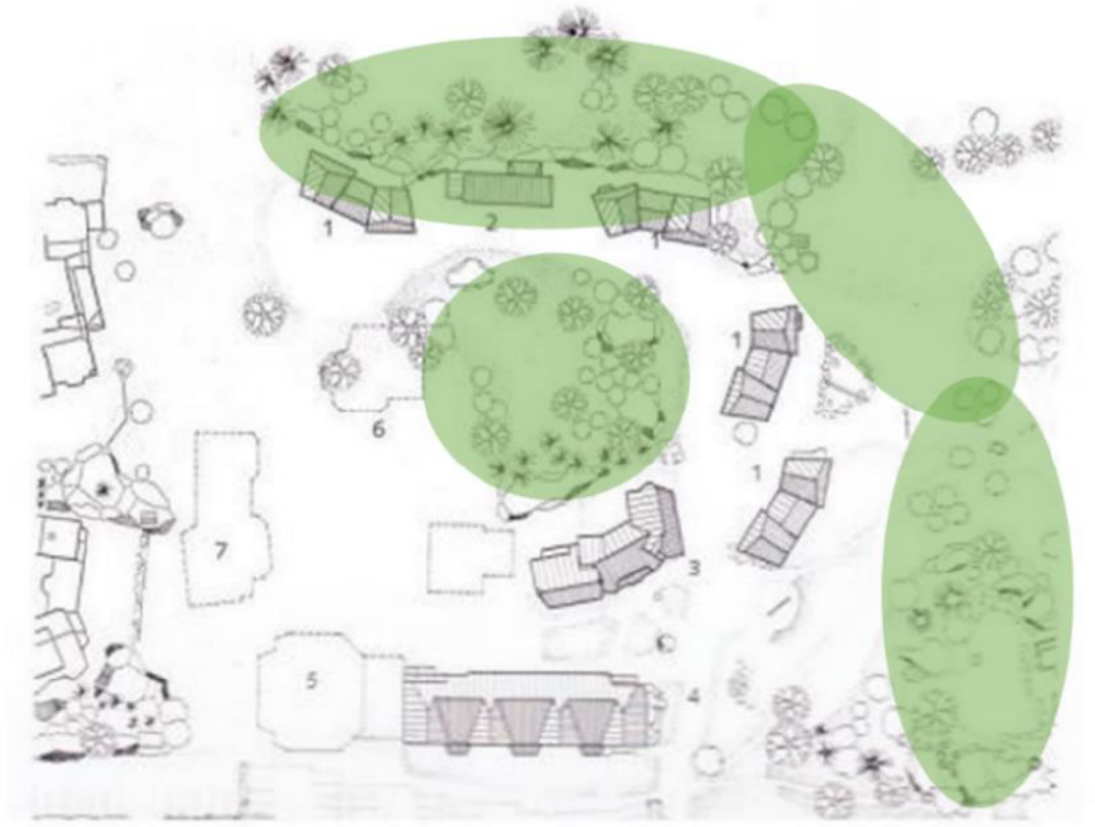


Figure 4.5 - Orjan School Site Plan, showing green spaces, Source: (Coates, Gary. Erik Asmussen, Architect. Stockholm: Byggförlagte, 1997. 28), Adapted by the author

Another way to look at the same concept is to put nature, such as the atrium in the Freie Waldorfschule, Figure 4.6, into the house. In this example, they become involved with an element of nature whenever the kids leave a room. A similar concept is to construct several, smaller court yards that carry a piece of nature directly into the building during the building.

Figure 4.6 – Freie Waldorfschule Central Atrium, Source: Blundell, Jones Peter. Peter Hübner: Bauen Als Ein Socialer Prozess = Building as a Social Process. Stuttgart: Edition Axel Menges, 2007. 188

At Fuji Kindergarten outside Tokyo, the building wraps around several existing trees on the site, figure 4.7. Through the framework, punctures are made, allowing the trees to tower directly over the school. Figure 4.8 demonstrates how the trunks are visible from inside the building and are accessible.

Figure 4.7 – Fuji Kindergarten Aerial, Source: "Kindergaten in Tokio." Detail (2008) V.3: 187-99. 191

Figure 4.8 – Tree Penetrating Through the Space, Source: Gregory, Bob. "Learning Curve." Architectural Review Aug (2007): 32-39. 39

The definition of a tree can also be taken in a different direction. To imitate the form of a tree, the structural columns that support the school's roof can be formed. Figure 4.8 is an example of the use of wooden columns by a Waldorf school with branch like supports extending from them to support the roof above, which functions like a tree canopy. A representation of nature is also the use of natural materials in this example. Children will look at these objects in several ways to understand how humans use the natural environment.

Figure 4.9 - Columns Mimicking the Form of Trees, Source: Blundell, Jones Peter. Peter Hübner: Bauen Als Ein Socialer Prozess = Building as a Social Process. Stuttgart: Edition Axel Menges, 2007. 261

Another way of bringing nature and architecture together is to bring the cyclical qualities of nature into the built environment. Instead of being a static structure, the building can respond to and change with each season of the year. One simple approach would be to employ window shading devices that can be removed or retracted when they are not needed in the winter. A green wall can also be employed to reflect the change in season. A green wall is the use of vegetation to cover the façade of a building by either allowing the vegetation to directly grow on the building or on a separate supporting structure. In the fall, the building itself will appear to change colour, then reveal its true skin in the winter, and have a rebirth of life on the building in the spring.

4.5.2.4 Natural Lighting

'Waldorf Pedagogy is a theory that values what the advantages human beings have to offer in interaction with nature. Natural illumination in their schools is also highly regarded (Migliani, 2020). However, the contribution of natural light can be different, generating infinite possibilities for indoor atmosphere, based on the behaviour to be carried out in its various spaces.

Biophilic philosophy of Light and Space testifies to the use of natural light and architectural spatial features to enhance the sensory and integrate nature in its shape (Kellert, 2008). It is especially important to use natural light because it has restorative and calming properties for people, creating uplifting learning environments.

Figure 4.10 – Natural light filtering into a space, Source: https://images.adsttc.com/media/images/5e6f/c07a/b357/653d/d300/034e/slideshow/El_Til%C2%B7ler_School_24.jpg?1584382056

Architectural response

In a Waldorf school, natural light is a very important factor; it is favoured in any circumstance over electric lighting. The architecture must be capable of being assisted to the maximum extent possible by daylight. Natural light 's dynamic qualities are much more appealing than the solid and steady light produced by electric light fixtures. By embodying sustainability principles such as: passive solar heat gain for the winter, rainwater collection to flush the toilets, a green roof to mitigate storm water runoff and the heat island effect, rainwater garden, permeable paving, and locally grown materials, the building should value nature.

The use of shadows and diffused and mirrored light, through design elements such as courtyards, views, fenestration and openings in façades, creates interest, contrast and a connection to the natural world in order to allow natural light to penetrate a building (Kellert, 2008). In school architecture, correct orientation, combined with wide windows with proper shading devices, must be built into the buildings in order for adequate natural light to penetrate classrooms and other spaces inside the school (Barrett & Zhang, 2009). Ideally, in order for children to be able to open and close them, windows should be placed at lower heights (Hertzberger, 2008). Windows and light shelves by Clerestory allow light to be spread in larger volumes and deeper spaces, retaining a good visual quality of the room. In relation to the window design, natural light can also be influenced by the closeness of nearby buildings or trees (Barrett & Zhang, 2009).

4.5.2.5 Inclusion of the Arts

Evidence suggests that the rural community is rich in culture and tradition, however this community influence is seen to be excluded in the learning process and architecture of rural schools. In certain public-school settings, an art class only takes place once or twice a week for no more than an hour at a time. The arts, when funding becomes too low, are one of the first parts of the curriculum to see cuts or even be removed. In a Waldorf school, drawing and painting are an integral part of the entire program; almost all the students do is infused into it. 'Art gets the children emotionally involved in their education, which is an important aspect of Waldorf education', (Jolley, 2010).

Architectural response

Using various local materials in the structure is one way of incorporating artistic concepts into the design of buildings. The building would appear to become less monotonous than traditional public schools by doing so. This will also illustrate how different materials, just as different art media are capable of producing different effects, cause different effects.

As they become the skin of the built form that can be used to invoke senses of sight and touch, material materiality and tactile qualities of materials are an essential component of architecture.

'Classroom spaces are known to be the crux of a school as this is where majority of the learning process takes place' (Hertzberger, 2008). 'Classroom design should therefore recognise and acknowledge the way in which children learn and how teachers teach, and should aid the learning process' (Hertzberger, 2008). 'Educationists have established that there are four main types of classroom learning organisations in primary schools viz. whole class, individual, paired, and group work' (Edwards, 2005). To these learning organizations, elements that make up a school, and classroom spaces, should react. This is referred to by Barrett & Zhang (2009) as the Degree of Stimulation through Complexity, Colour and Texture offered in school buildings.

- Complexity-An opportunity to empower learners and teachers through diversity is the appearance of a school building and the spaces within. Diversity in the school setting allows for a range of shapes and forms, as well as material choices (Barrett & Zhang, 2009). In comparison to what can be achieved using artificial materials, natural materials can exude a sense of the continuous nature and process of life (Kellert, 2008). Pallasmaa (1994), states that natural materials such as wood, stone and brick can express age, history and human use in architecture when it comes to the use of natural materials in architecture. Such materials also offer a weathering experience of time (Pallasmaa, 1994; Kellert 2008). Natural materials cannot always be acceptable or affordable for school design, so alternative approaches are explored to enhance the sensory experience in learning environments.
- Colour - The colour psychologists have found the use of particular colours in educational settings to be more than just aesthetically pleasing, they also encourage mental and physical wellbeing and growth in children (Barrett & Zhang, 2009). Children from pre-school to

primary school age were found to respond to warm, bright colours in learning spaces through research studies, which decreased tension, nervousness and anxiety (Barrett & Zhang, 2009). The known colours include yellows, oranges, corals, and peaches. More subtle colours, such as pale greens, can be used in other spaces such as libraries to elicit a sense of quietness among learners (Barrett & Zhang, 2009).

- Texture - The sense of touch of children is activated by various textures inside school environments. Apart from the impact on teaching and learning of the general material choice of building materials, Barrett & Zhang (2009) note that material tactility makes a significant difference in outdoor spaces to the senses of children. With the use of natural planting and hard and soft landscaping, the outdoor setting offers different opportunities to introduce various textures to children. Over time, learners will watch the same shift in environment, i.e., from lush planting to bare trees, thus stimulating their learning.

4.5.2.6 Eurythmy: The Body in Space

Eurythmy is an art form developed by Rudolf Steiner that uses rhythmic exercises to put the conscious mind and the active limbs into harmony. The exercises work in two ways, the movement experience in space and the awareness experience in the mind. As part of a community, the gestures are still finished, because it's not only about a greater sense of oneself, but also an understanding of each other. As the kids slowly learn how to move with their body, the exercises increase in complexity. (Jolley, 2010).

Eurythmy is not only about rhythmic movements alone; it is about the convergence of the program with other fields. There are strong similarities between music and movement, such as the difference between 3 and 4 times, or a fast pace versus a slow pace. This is just the beginning of the association of eurythmy with the remainder of the education. (Jolley, 2010).

Architectural response

Since eurythmy is about experiencing one 's body in space, having various volumetric experiences inside the building is a great way to further this concept architecturally. Figure 4.11 is a diagram of some distinct forms in space a person can perceive their body. An individual may be sheltered under a tree canopy, in a small tight room, at the bottom of a tall space, or in the upper level of a multi-storey space, in the vast openness of a field. They all provide opportunities to experience space, and they can more easily be compared to each other when combined together in one building. In terms of the sequence of a building and how an individual passes through it, Eurythmy can also be thought of. A complex and rich experience can be generated for the visitor by utilizing the various volumetric spaces in a specific sequence. Perhaps when entering a space or building, there is a specific sequence of spaces a person will always encounter. The experience is more satisfying than a monotonous road, by widening and contracting one's route through a house.

Figure 4.11 - Diagram of Volumetric Experiences, Source: Author

Public squares - Square-like areas are used in classrooms to collect teachers and learners, and parents are used on some occasions, so the assembly area in a school is similar to that of a public square. Hertzberger (2008) introduces a design feature that enables space users (specifically children) to use steps to decide the purpose of that space.

The implementation of measures, in relation to the development of public squares in schools, offers the concept of spaces by lowering or raising floor pieces. Steps are used to provide opinions and offer defence as transitional

elements (Hertzberger, 2008- Figure 4.12). The use of steps in combination with public square spaces in schools provides a sense of place by encouraging children to "perform" spontaneously or by providing platforms on which to function, i.e., by using the built elements of that location, they have a connection to that location (Figure 4.13). From a child's perspective, the possibility of using sunken or secret spaces is infinite and should be more considered in the design process.

By allowing different age groups and subject matter to be taught at different times, the introduction of courtyards will gain, whereas the advantage of one communal courtyard is that it allows for greater participation and growth of the school.

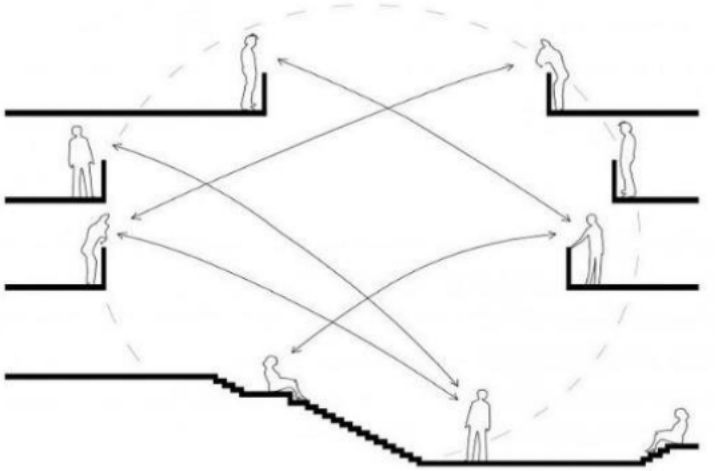


Figure 4.12 - The use of steps with public square, Source: Hertzberger, 2008

Figure 4.13 - Use of steps adjacent to public space in Romanina Elementary School, Source: Faiferri, 2012

4.5.2.7 Flexibility

Since the activities developed by the Waldorf philosophy are very dynamic, it is important that the interior composition is very flexible, creating a living and active atmosphere. There are several common solutions to this need, explains Migliani (Migliani, 2020). So that they can be easily removed, tables and chairs should be light. Uncovered courtyards can act as theatrical environments. It is possible to use covered multi-sport courts to celebrate the different festivities present in the Waldorf curriculum.

Figure 4.14 – Flexibility of spaces, Source: https://images.adsttc.com/media/images/5e6f/c02d/b357/653d/d300/034b/slideshow/El_Til%C2%B7ler_School_11.jpg?1584381986

Geometric Perception - According to anthroposophical thinking of the Waldorf pedagogy, in schools, progressive transformations of geometric forms are very important as age ranges shift. It is common, therefore, to see:

- Unconventional frame geometric forms.
- Formal differences in the vertical planes (walls) and horizontal planes (floors and ceilings).
- Trapezoidal shaped planters.

'Freedom is an important concept in this pedagogy' (Migliani, 2020). Steiner defended the use of divergent walls because, in his view, the user's appearance in the environment can be democratized (convergent walls tend to direct), freeing their movements and their focus of attention. Many colleges, therefore, select a trapezoidal shape for their divergent walls.

Each classroom (divided by age group) has a preferred format so that children's internal development can be accompanied by geometric transformations. Classrooms had a mainly organic style in the early years. The angle is added little by little, and the classrooms become more elongated. Therefore, for preschool children, anything that has more rounded lines, is unified, and is primarily lighter is commonly allocated. All will become firmer, more expressive, and angular over the years. The subconscious purpose of this technique is to direct the child's perception of the notion of shapes, to establish a deeper aesthetic meaning.

Figure 4.14 – Axonometric. After-School Care Centre Waldorf School / MONO Architekten., Source: https://images.adsttc.com/media/images/5e6f/c4fb/b357/65c4/1200/070b/slideshow/04_axonometry.jpg?1584383216

4.6 Conclusion

The opening of a school in a rural community should work both ways. The former tends to see itself as a multi-purpose cultural centre. The school library serves as public library; the assembly hall is the local theatre; the science laboratories, workshops, sports facilities, audio-visual studios, and documentation centres are made available to the community at least after school hours and during the holidays. Giving the school roots in the surrounding social context, to draw it out of isolation and fit it into the community, not only in rural districts but in the towns and urban centres too. The integration of parents and community members, directly into the school structure, to

associate them with the design of education, especially in 'community schools' or 'schools for parents. Similarly, efforts are being made to bring the school closer to the working world, despite the fact that these are often artificial attempts to overcome the rigid dividing-line between intellectual and manual work. A good school building is an expression of a particular school community's soul and spiritual life.

The sections discussed here should not be looked at in isolation, but rather as a collective in designing a school that connects with the community by using the community influence, as well as natural sensory elements to promote learning, teaching and community upliftment.

Built architectural examples will demonstrate the concepts discussed here in the following chapter, which will contribute towards devising a new set of architectural guidelines for a primary school with community influenced spaces.

Chapter 05 – Key precedent studies

5.1 Introduction

This chapter continues as an extension of chapter four. It will review three existing education facilities that respond to the issues defined in the literature review. Each precedent study will be analysed in relation to the theoretical framework to understand how the following facilities have succeeded or failed. This process will begin with regards to how the architecture of learning spaces can be influenced by the community. This includes the analysis of the design process, the location, the physical design which includes the linkages theory, issues of physical connectivity, the theory of blurring boundaries, the micro-design, and the physical conditions of the learning spaces.

Due to the COVID-19 pandemic, social distancing regulations have limited the ability to conduct field research, therefore the researcher has opted do a three precedent studies, to critically analyse the respective building.

The following precedent studies have been selected for their individual success internationally with regards to the issues discussed in the literature review and theoretical framework. The locations of each project are illustrated below to provide context in the scope of the study. The analysis of these projects will lead to the case study, which will be discussed in the following chapter.

5.1.1 Location and motivation of precedents

5.1.1.1 Chipakata Children's Academy, Lusaka Zambia

Figure 5.1.1 – Map of the world highlighting Zambia, Sources: https://geology.com/world/map/map-of-zambia.gif

Figure 5.1.2 – Map of Zambia showing location of the school, Source: https://exploringafrica.matrix.msu.edu/wp-content/uploads/2015/04/areamap_zambia.gif, adapted by author

This precedent study has selected with the intention to investigate of how to integrate education and community into the rural fabric. This precedent will be analysed in terms of the theories surrounding integration such as the linkages theory, Waldof pedagogy, critical regionalism, and place-based theory. On a macro scale this facility connects the school and the community and maximises interaction. It has also shown how the built environment and the design process can respond to the learning philosophy and vision of the institution.

5.1.1.2 Primary School in Gando

Figure 5.1.3 – Map of the world showing Burkina Faso, Source: https://geology.com/world/map/map-of-burkina-faso.gif

Figure 5.1.4 – Map of Burkina Faso showing school location, Source: https://wwwnc.cdc.gov/travel/images/map-burkina-faso.png, adapted by author

The precedent study was selected, with the aim to analyse of how the community involvement and vision in conjunction with the design process can define the built environment and create a platform for a self-sufficient community. The precedents will be analysed with a key focus on its design process, physical design, micro-design, physical conditions, and theoretical discourse and how the built environment can respond to the learning philosophy and vision of the institution and how the built environment can affect perception and the quality of educational outcomes. The school calls on sustainability principles and the theory of critical regionalism, which are a key element in the success of a rural school.

5.1.1.3 Fountains Primary School

Figure 6.1.1 - Map of South Africa showing KZN and Kokstad, Source: https://www.thesafaricompany.co.za/images/map_kzn.jpg, adapted by author

The purpose of this precedents is to investigate, sufficient blended learning environments *to* empower the individual learners and promote social learning processes. The school *aims to* provide individual learning spaces, efficient group work opportunities, informal learning opportunities and technological support. *The theories and concepts aimed to be explored in the following precedents are* micro-design of the learning spaces, *critical regionalism, place theory and Waldorf pedagogy.*

5.2 Chipakata Children's Academy

Architects - Susan Rodriguez + Frank Lupo + Randy Antonia Lott

Location - Lusaka, Zambia

Year - 2015

Figure 5.2.1 - Chipakata Children's Academy, Source: Archdaily , 2020

5.2.1 Introduction

The Chipakata Children's Academy is a new primary school in Zambia, Africa. This is the first initiative of the 14+ Foundation (Chipakata Children's Academy - 2020), a non-profit organization founded in 2012, headquartered in New York city. The new school model honoured the Foundation's mission for creating, building, and operating schools and orphanages in rural African communities. The village of Chipakata is situated about 100 kilometres to the east of Lusaka, Zambia's biggest city. The project defines a sense of place and identity for the settlement, located on a topography level overlooking the east and west surrounding hills. Locating the school inside the village has significantly shortened the distance that kids have to travel to school every day, since it is seven kilometres away from the closest school (Children's Academy of Chipakata-, 2020). The Academy provides an integrated primary education grade 1–7 for children in seven villages in and around the city of Chipakata Village.

Figure 5.2.2 - Community gathering space at Chipakata, Source: Archdaily, 2020

5.2.2 Layout and spatial planning

The initial phase, which opened in January 2015, comprises a building built to hold classroom, a community pavilion, and teachers' housing as seen in Figure 5.2.2. In the vicinity, food- and income-generating agricultural fields fund the running of the school and ensure the long-term economic viability of the project. The critical regionalism of Kenneth Frampton examines the relationship between modern architecture and a current context. The goal is to construct meaningful spaces and buildings through the relation of modern developments with their spatial contexts. The architects have taken the local conditions like atmosphere, physical and structural features of landscape and lighting quality into crucial consideration and comprehension. This brought geographic suitability to a particular context and gave the locals a sense of ownership and played a leading role in the growth and building process.

The classroom layout style, which relates to regional school planning typologies, turns the conventional model into a modern framework. The architecture makes ten teaching and learning areas in contrast with the four rooms in the traditional version. The effect is a breakdown of the monolithic volume of the classroom's traditional bar-construction and an opening for communication between classes, as seen in Figure 5.2.4. The small number of educational spaces at primary and rural schools in general could shift the

value of a school being a group by enhancing the education level. This is a core element of a sufficient rural school in Waldof pedagogy. By having the same students and teachers in - class, the collective becomes their own culture. Children become very knowledgeable of each other to the extent that they know each other's strengths and weaknesses. So those who are more skilful will assist those who are less skilful as such situations arise. 'The ties that students develop help them to grow and mature together and give them the feeling that they can trust in a home' (Jolley, 2010). That may be an improvement in rural schools, as the majority of children come from divided houses in these rural areas with the key contributors being poverty and social problems. 'Similarly, the teacher is an important source of authority that children are searching for continuously' (Jolley, 2010). The concept of culture is extended beyond a single classroom and into the organization of each school. The faculty remains, everyone share responsibility for how the school works. As a group of equivalents. The members of the group are assisted and directly active in the physical school and learning structure.

In comparison, with open-air spaces just above one of the four classrooms, the height of the roof canopy above masonry base in figure five.2.4 allows the upper floor to be accessed by stairs. The windows and the rooftop canopy are set up to optimize sunshine in the classrooms, informed by local environment and heat.

Figure 5.2.3 – Classroom atmosphere, Source: https://www.world-architects.com/images/CmsPageElementImage/01/43/67/5903cc8304a447f2bd3a346367d6201c/5903cc8304a447f2bd3a346367d6201c.f5fb7444.jpg?1493421200

The clearstory Windows are located at all stages of hard solar gain in both classrooms with continuous roof tops that are overhanging to cover areas in season. A collection area next to the classroom building, a triangular arrangement that guards against the sun and the rains and offers a versatile place to feed, assemble and rejoice in the community.

In the Chipakata Children's Academy, the method to basic education is predominant. Local education, the "a teaching and learning approach that combines learning with local learning" (Smith and Sobel, 2010), reduces gaps between schools and communities. PBE was used by the architects to counter university isolation and create linkages between colleges, community partners and the local community, by anchoring learning in a student's way. When relations between learning and location are fostered, learning becomes important and significant in student lives. 'When community assets and needs shape learning, students are empowered to become actively engaged citizens' (Rae Rote, Schroeder and D'augustino, 2015).

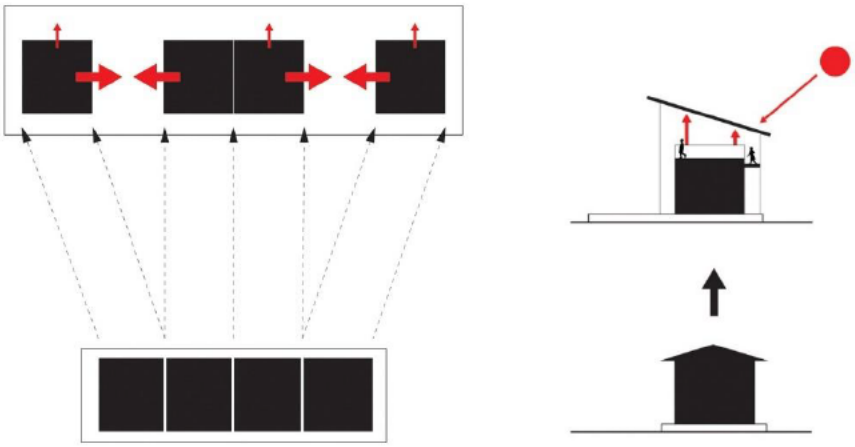


Figure 5.2.4 – monolithic volume of the typical classroom bar building and introducing open space for collaborative activity between classrooms, Source: Author

Figure 5.2.5 – Elevation of roof canopy, Source: Archdaily, 2020

5.2.3 Community influence

From planning the site, digging foundation pits by hand, hand-mixing and installing all the concrete used in the project, helping with hand-setting structural steel parts, carrying out the masonry block work, installing windows, finishing plaster and finally painting the house, the parents of the village children were trained and put to work on all tasks. The parents of the village, who built a school for their children, giving them a sense of place and a link between the school and the town, had a great deal of pride in doing this.

The creation of a 'sense of place' in architecture refers to the creation of a relationship between (architecturally) built spaces and location, and how those spaces can have beneficial effects on users. This study is often focused on the natural world that leads to developing a sense of place. The natural environment

According to Norberg-Schulz, architecture creates environments where the inhabitants grasp, remember and feel comfortable (1980). This attribute of a site, or "spirit of place." is called Genius Loci.

Figure 5.2.6 – Community gathering space, Source: https://www.world-architects.com, 2015

5.2.4 Response of the Built Environment and design intent

The design process started with an emphasis on environment and ecology by the required solar orientation of the building and the use of local materials. The architecture of the Waldof Pedagogy is based on ideas from the regions indigenous architectural traditions and philosophies. Natural illumination in a Waldorf school is a very significant factor; artificial lighting is preferred under all conditions. 'the biophilic architecture of Light and Space demonstrates the use of the ambient light and spatial elements of architectural structure to maximize sensory perceptions and incorporate nature into form' ' (Kellert, 2008). The use of natural light, as it provides restorative, soothing and uplifting learning opportunities for humans, is especially significant.

The classroom architecture was designed to face the extreme African sun (Figure 5.2.7) and to allow the sloping ceiling to provide effective day-to-day protection from the sun. The same roof surface is fitted with electricity panels and evening lighting.

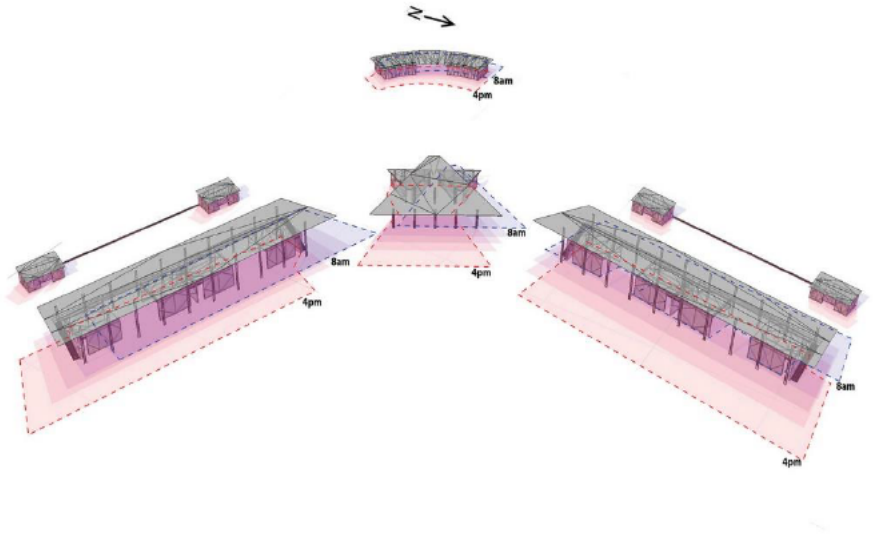


Figure 5.2.7 – Orientation of school, Source: Archdaily, 2020

The vernacular architecture of Zambia and the village of Chipakata is made up of terrestrial shelters surrounded by a lightweight woven plant material that shades and shielded from the elements. The architecture interprets these components and features and draws on them to construct an equally important, minimal and practical approach. The "grounded" items on a pedestal are the classrooms that display their relevance in education. In response, the specifics of the architecture developed in response to the character of indigenous earthen shelters and the design and rich selection of regional textile styles. This is seen in the decorative screen walls at the end of the bars, the three-angular geometry of the roof framework and in the gates to the rooftop classrooms of the second level, where steel is twisted into vines and saplings. By designing the physical and construction-able simplicity inspired by both programmatic criteria and climate necessities, the school adheres to the values of indigenous architecture of the region.

5.2.5 Materials

The project is constrained in budget, which is why the architects selected inexpensive, durable and poorly maintained materials: earth-coloured cement block walls, concrete or stone paving floors, roof building metals.

The building is built on a modular basis with the repetitive structure of both the Masonry classroom and the roof canopy. All material was imported and manufactured locally on site. The textural quality of the united steel building is reflected in the show walls, which enclose the stairs at both ends of the tower.

Figure 5.2.8 – Construction phase of school, Source: Archdaily, 2020

5.2.6 Conclusion

This previous research shows that it is a very good example of how schooling and the culture are blended into the rural environment which has changed not only the education quality but the community around it. This initiative, which is aimed at achieving a rural primary school, analyses integration theories such as linkage theory, Waldof pedagogy, critical regionalism and place theory. This building integrates the school and the city on a macro level and maximizes engagement. It also demonstrated how the building environment and design process would adapt to the institution's educational philosophy and vision.

5.3 Primary School in Gando

Architects - Kéré Architecture

Location – Burkina Faso

Year – 2001

Figure 5.3.1 - Gando Primary School, Source: http://www.kere-architecture.com/files/8614/0741/4776/Primary-School_Duchoud00.jpg

5.3.1 Introduction

The rationale for using this preceding analysis is based on the incorporation of this facility into the culture, which greatly adds to the theoretical debate in this research. It illustrates the effect of the place and physical architecture on the advancement of education through the built environment and the community's importance in achieving this aim while also building a culture of resilience and freedom. Burkina Faso is a German architect, Francis Kere, a native of Gando. Kere, who has grown up in a remote settlement without school services, was forced to go to school 40km from a settlement (Kéré, 2012; pp.67). Gando is made up of almost 3000 people, with an 80 percent illiteracy rate, with no option for farming (Kéré, 2012; pp.67).

5.3.2 The community influence on the built environment

Though Francis Kere has drawn up plans for the primary school, the project's success can be credited to the close participation of the local villagers. The members of a group in rural Burkina Faso work together to build and restore

houses. Traditionally, they work together. In combination with these cultural traditions, low-tech and sustainable technologies have been developed and improved to allow the people of Gando to participate. Children collected stones and the women took water for the construction of bricks to the base of the school. In order to produce highly quality building technologies while simplifying design and upkeep for the workers, classical building techniques were thus used in combination with modern engineering approaches.

This hands-on approach of building and connecting nature and the children are concepts expressed in experiential learning theory. David Kolb's (2005) definition uses practice as a base for understanding. It helps learners to gain the skills based on their own, opposed to typical approaches in which teachers are the only source of learning in a school setting. For the Gando School, the real world is based on through experiential research. The theory of biophilia is explored as an extension of this hypothesis. Two years after the conclusion of primary school, more than 260 children from Gando and its surroundings were asked to attend school. It quickly became apparent that an extension was required to achieve the education of these students.

The building became an important landmark in the region since the primaries were built in close partnership with members of the society of Gando. Because the material quality and architectural expression of the building became such a clear emblem for Gando itself, the new extension has been designed with same principles and methods. The school extension was also manufactured by hand.

Figure 5.3.2 – Exterior view of Gando Primary School, Source: Archdaily, 2016

Figure 5.3.3 – Extension of Gando Primary School, Source: Archdaily, 2016

5.3.3 Design intent and materiality

A wide range of criteria including cost, climate, resources and building viability have been created for the Primary School Design. These shortcomings were both acknowledged and ignored in the success of the project. In order to maximize efficiency with scarce capital, a clay and mud hybrid construction was mainly used. Clay is widely available in the region and is often used in

construction. These traditional clay-building methods have been revised and modernized in order to construct a more structurally sound structure in the form of bricks as Figure 5.3.3 indicates. The additional advantage of clay bricks is that they are cost-effective, simple to make and thermal protection against the heat climate. Despite its power, though, the walls must also be protected by dangerous rain with a wide surpassing tin roof. Many houses in Burkina Faso have on-board metal roofs that trap sunlight heat and make the interior of the living room intolerably hot.

Figure 5.3.4 – Materiality of Gando Primary School, Source: Archdaily, 2016

However, the primary school roof was pulled away from the school, and a sufficiently ventilated perforated clay ceiling was added. The dry-stacked roof makes complete cooling, draws cold air from the windows inside and emits hot air through the perforated roof. Essentially, the ecological footprint of the school is greatly lowered by alleviating the need for air conditioning.

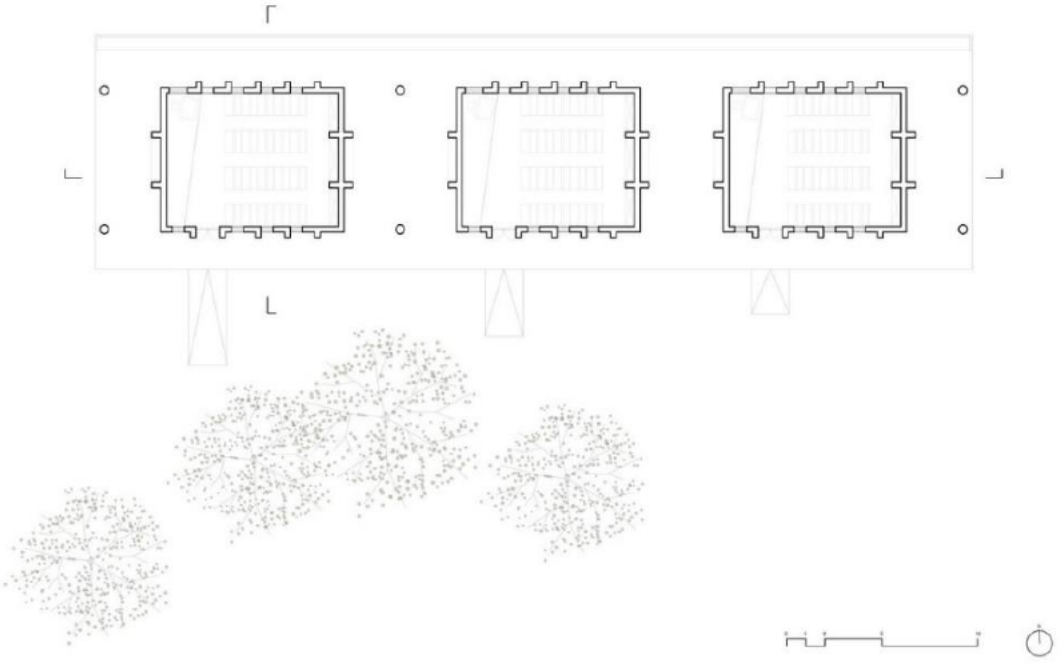


Figure 5.3.5 – Plan of Gando Primary School, Source: Archdaily, 2016

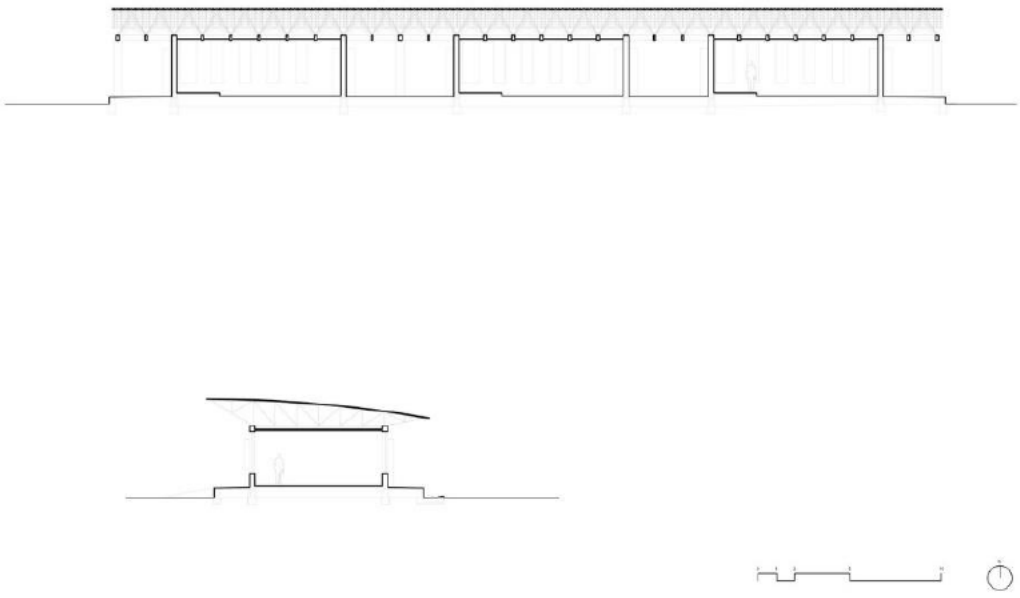


Figure 5.3.6 – Section of Gando Primary School, Source: Archdaily, 2016

The library was last completed in 2012 and the school extension in Gando is completed. (Bruno College, n.d.). For the city, this library is an important success because it provides many those outside of school access to information.

Figure 5.3.7 – Aerial view of Gando Primary School Library, Source: Archdaily, 2016

The eucalyptus rhythmical facade around the library presents a calming and flexible space for students to rest and read. The eucalyptus wood was first used in Gando for construction. Eucalyptus is widely used in Burkina Faso as a firewood material, because it dries out the ground and can provide just a limited amount of shade. The roof architecture further reflects architectural advancement. The ceiling was originally used to maintain light ventilation and air circulation following elimination of the typical clay pots. The furniture was eventually introduced into the house, for example, with a large table situated in the centre of the main space.

Figure 5.3.8 – Gando Primary School library roof construction , Source: https://images.adsttc.com/media/images/5024/1638/28ba/0d4e/9a00/00a2/slideshow/stringio.jpg?1414098347

Figure 5.3.9 – Natural lighting filtering into the Gando Primary School Library, Source: https://images.adsttc.com/media/images/5024/1640/28ba/0d4e/9a00/00a6/slideshow/stringio.jpg?1414098359

5.3.4 Conclusion

This previous study shows that group engagement and vision will describe the environment designed and build a forum for self-sufficiency in connection with

the design process. This process produced a common vision, a sense of identity and overcame low educational quality and awareness problems. It displayed abilities in architecture, physical design, micro design, physical environments and theoretical expression. It also demonstrated how the built environment can react to the institution's learning style and vision and how the built environment can impact the interpretation and the consistency of educational performance. The school relies on concepts of sustainability and the critical regionalism theory which are crucial to a rural school's success. The architect implements Waldorf Pedagogy concepts that lead to the advancement of education standards while preserving the municipal budget and materials.

5.4 Fountains Primary School

Architects - East Coast Architects

Location - Shayamoya, Kokstad, Kwa – Zulu Natal

Year – 2007

Figure 5.2.1 -View of the Seven Fountains Primary School, Source: https://www.eastcoastarchitects.co.za

5.4.1 Background and Justification of Study

Seven Fountains Primary School in Shayamoya District, Kokstad has more than 1000 students.

An unusual combination of a painful past, a cohesive school tradition and external support has driven architects to maintain a high degree of group participation in creation, decision-making, design and use processes from the beginning. In the seven-fountain estate a few kilometres from Kokstad, since he did not obtain the funding it needed, the farmer had partly demolished and cleared over 400 school pupils from the seventy-year-old rural school. Teachers and students had packed into an abandoned hostel in the recently formed neighbouring "RDP" town of Shayamoya, where their numbers were 900. In

partnership with the KwaZulu Natal Department of Education and the same budget as other KwaZulu-Natal public schools of this size, Oprah Angel Network realized how a new school would do for this community and financed the building of a facility at R12 million for this scale (details of Seven Fountains Primary School, n.d.). Sponsorship by the KZN education department which would run the school until completed was a complimentary aspect which was dedicated to implementing a new prototype of a truly community-based approach to school construction in rural areas.

The school aimed, instead of allowing the architecture of a school to evolve organically, connected with the society which it built and represents, to move away from all the practices of parachuting blueprint buildings in rural areas.

The following prerequisites have been set up to ensure the replicability of the project in other underdeveloped rural areas:

- The regular departmental accommodation schedule will apply to
- Enrolment will be limited to 1000 primary school learners from Grade R to Grade 7.
- The construction budget will be limited to the expense of building a regular primary school in the department.

5.4.2 Layout and spatial planning

The architects choose inclusive, open design processes in the process of designing and building schools that allow meaningful relationships to develop between ourselves as 'designers' and our client group, between donors and recipients, between government departments and various NGOs invested, between contracting parties and consulting professionals. In doing so, the school as an entity enhances its relations with the surrounding people, and the local community uses and cares for the facility itself. (Architects of the East Coast, n.d.)

In discrete play areas for student of different age classes, school building guards the site's perimeter. Both are physically controlled by the distributed

education departments. Figure 5.2.3 demonstrates greater access to the city through a range of pathways and doors without compromising the protection of schools.

'Township of Shayamoya is home to a mostly impoverished and unemployed population that lacks considerable infrastructure' (Buckland, 2020), which suggest an opportunity to meet the community needs of a primary school and its particular needs for this initiative. The following figure 5.2.2 illustrates how the 7-fountain school is designed in order to enable the general population to learn more about agriculture, natural science, and wellness after hours through a variety of school services, including sport grounds, computer rooms, libraries, adult education centres, and supplies of potable water with landscaped planting. The school serves therefore as a cultural hub and should feel like it belongs to the society as a whole.

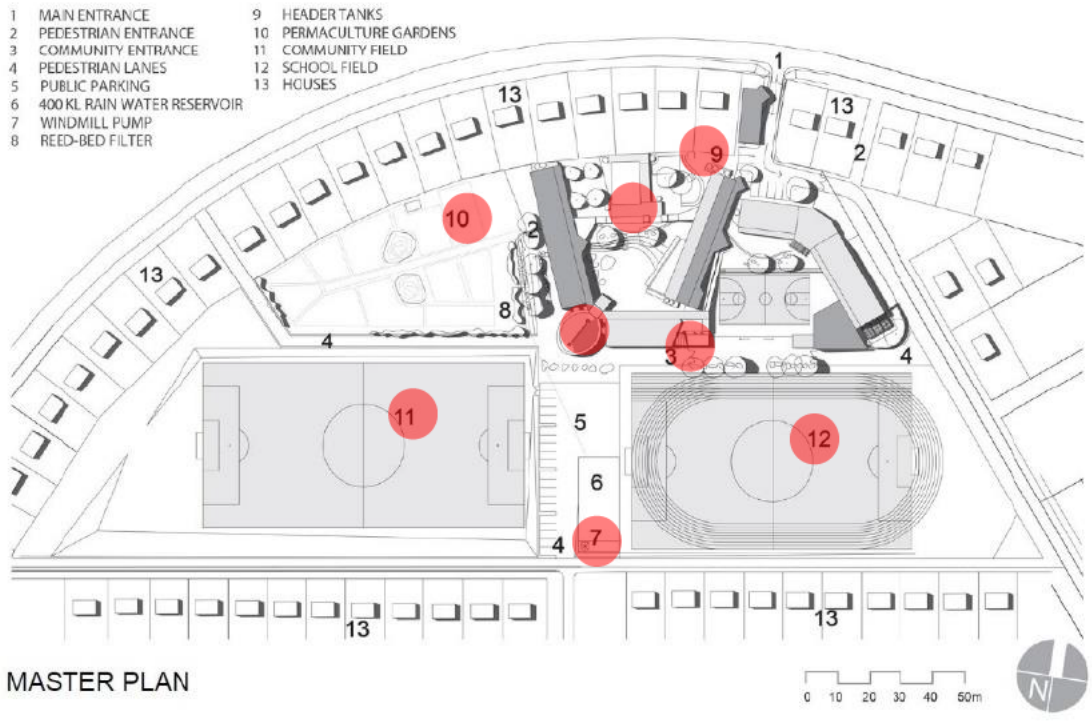


Figure 5.2.2 - Site plan of Seven Fountains Primary School, Source: https://www.eastcoastarchitects.co.za, adapted by author

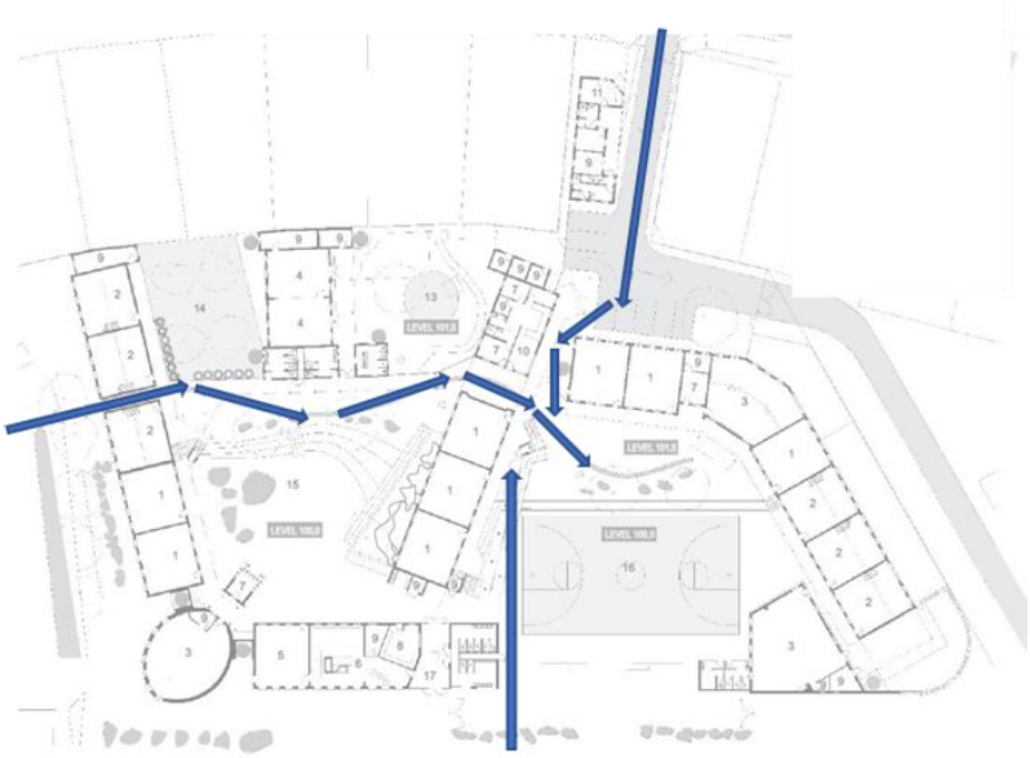


Figure 5.2.3 - Pathways and gates without compromising school security, Source: https://www.eastcoastarchitects.co.za, adapted by author

The Waldof pedagogy addresses, as mentioned in chapter 4, the idea of the Eurythmy that constitutes the space body. One way to architecturally advance this concept is to deliver multiple volumetric environments. This is accomplished by multi-level courtyards and hierarchy of space and shape in figure 5.2.4. The Seven Fountains Primary School creates multi-level courtyards.

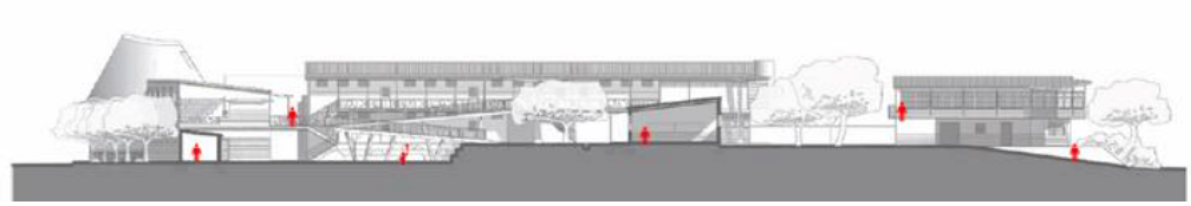


Figure 5.2.4 – Volumetric experience of Seven Fountains School, Source: https://www.eastcoastarchitects.co.za, adapted by author

Public squares – The seven fountains of School in figures 5.2.5 and 5.2.7 have square-like spaces. The assembly area at schools is almost equal to the one in the public square where teachers and students are gathered and, occasionally, parents are assembled.

Figure 5.2.5 – Main Public Square of Seven Fountains School showing the implementation of steps and folly like structures, Source: https://www.eastcoastarchitects.co.za

The implementation of steps and folly-like structures seen in Figure 5.2.5 provides a description of spaces in relation to the formation of public squares in schools by lowering or raising parts of the floor. Steps are used to provide opinion and security as elements of transition (Hertzberger, 2008). Using interventions in conjunction with public square spaces in schools seen in Figure 5.2.6 offers a sense of position in which children are allowed to spontaneously perform or by having platforms on which they can act, that is by using the built elements of that spot and communicating with that venue.

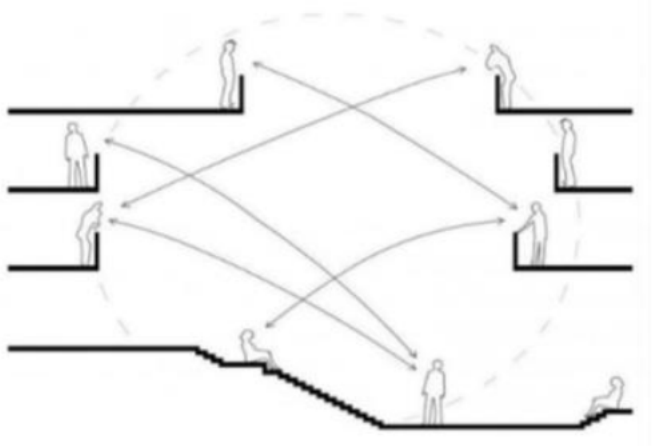


Figure 5.2.6 – The use of steps with public square, Source: Hertzberger, 2008

The installation of courtyards can benefit from the likelihood that multiple age groups and topics are taught at different times, as it facilitates further engagement and growth in the schools in a single courtyard.

Figure 5.2.7 – Diagram showing how the build form has been positioned to create various courtyard spaces, Source: https://www.eastcoastarchitects.co.za, adapted by author

A wide range of classrooms and mezzanine areas include opportunities for innovative instruction and initiatives. External teaching centres provide alternative learning experiences. The classrooms are built for artistic and cultural activities using conventional techniques. The media centre is conveniently located, open conveniently to the school and the surrounding community.

Figure 5.2.8 – Typical classroom at Seven Fountains School, showing the mezzanine level, Source: https://www.eastcoastarchitects.co.za

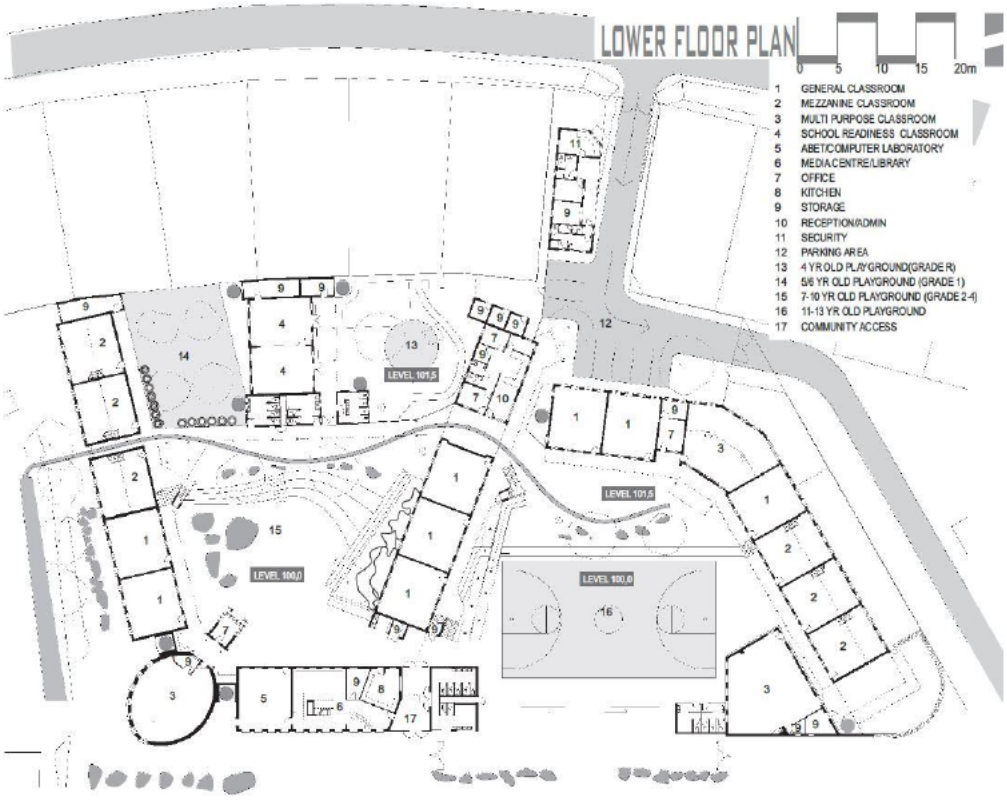


Figure 5.2.9 – Ground Floor plan of Seven Fountains School, Source: https://www.eastcoastarchitects.co.za

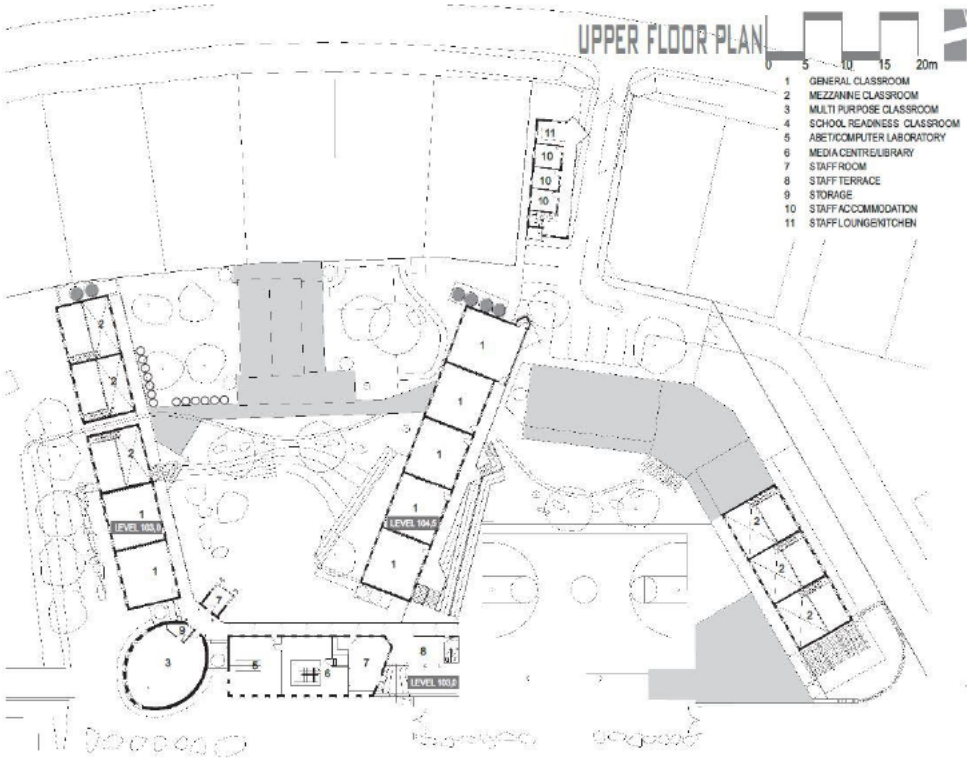


Figure 5.2.10 – 1st Floor plan of Seven Fountains School, Source: https://www.eastcoastarchitects.co.za

A series of innovative workshops started the process. Community members were brought together under the leadership of experts with expertise in the field of creative and participatory rural building technology. The architects stated that the workshops were used (East Coast Architects, n.d.), to flesh out design ideas (educators), promote positive relationships (learners), and create a clear atmosphere for design and construction (parents and wider community).

Figure 5.2.11 – (A) Woman making earth bricks, (B,C) Earth building under construction , Source: https://www.eastcoastarchitects.co.za, http://www.angelabucklandphotography.com

'A skill and material audit carried out at an early stage within the city has advised the collection of materials on the site' (East Coast Architects, n.d.). Residents have been taught to make and lay bricks using local materials and using pole and wood from local trees. The society remains rooted in the existence and possession of the buildings. This is most acutely shown in the double-story building (Figure 5.2.11 B, C) as a focal point for the school. It has

been developed from materials generated on site by local workers using traditional technologies and is thus fully embedded in this tradition. Walls were erected by a team of women using outdated technology. The business is rooted in involvement and control in the buildings. This is most acutely expressed in the double-story mudbrick structure which is the main draw of the campus. It consists of on-site materials produced by local staff.

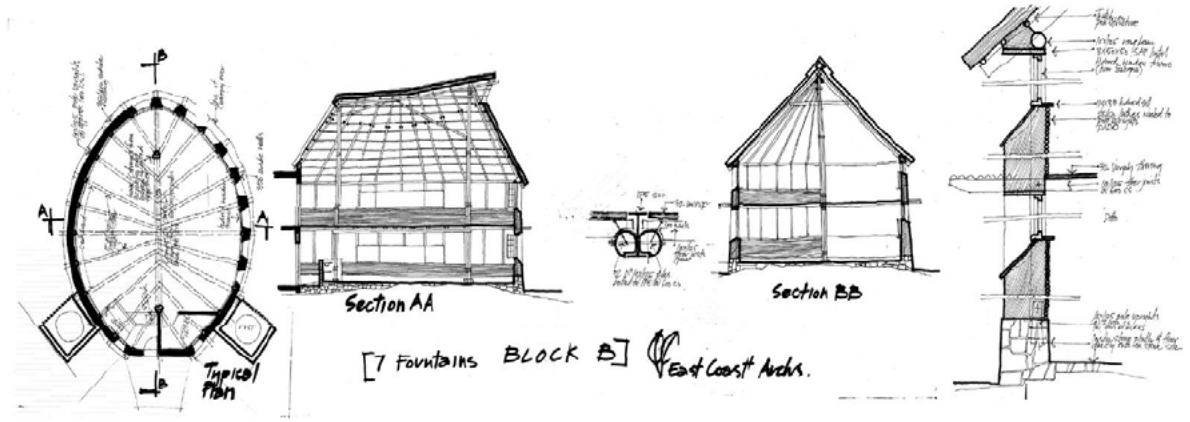


Figure 5.2.12 -Initial sketches of the two-floor earth brick building, Source: https://www.eastcoastarchitects.co.za

In the newly settled township, lack of social services led to early public access agreements for the required areas of the schools, sport fields, electronic labs and ABET classrooms. The contextual, spatial, and technical decisions about the school have been generated from the studio and the insights that architects have made from contact with the learners, teachers and parents. A network of workshops (for example, drawing of charcoal drawings, wall painting), newsletters and public gatherings invited extensive community participation, much of the staff being recruited from the same community. About 250 people in the local area worked during the construction, where 65% of the population gets no monthly salary. This school reveals the impact of the community on the design of learning environments, which directly increases education efficiency.

5.2.4 Sustainability design principles in the context of a rural primary

The Seven Fountain Primary School is an environmentally friendly school designed with the involvement of the community. Jobs have been developed, services have been used sustainably and the community has built a healthy environment conducive to learning for several years to come.

The architects identified a set of core design initiatives in Shayamoya in order to create a healthy school in order to increase the efficiency of educating and learning experiences at little or no added expense and to minimize the running cost and the effect of buildings on the environment (Details of Seven Fountains Primary School, n.d.).

The climate is rugged in Kokstad, with cool winters and warm summers. Passive and low-energy architecture strategies as shown in Figure 5.1.13 were used in order to create convenient learning environments with a minimum dependency on costly and unsafe energy sources during the seasons. They included: northern orientation; natural ventilation and illumination; south-facing terraces; light shelves / sun regulation; insulation and heat masses; Window scale and low-carbon energy goods (local as practicably possible).

Active techniques included: external photovoltaic lighting; solar water heaters; water pumps for windmills; rainwater collection, storage and pumping for toilet-flushing and vegetable gardens; potable water borehole; silt-reduction reed-bed filtration; and energy and water usage and thermal efficiency monitoring. From the outset, both students and educators were actively interested in understanding and regulating the processes of electricity and water use. A water reticulation process demonstration panel, combined with suitable posters in the classrooms and the exposure of water storage and energy-producing mechanisms in the building, combine to give all school users intense ecological awareness. Thus, in an under-resourced area faced with a fierce climate, the 'green' aspect not only produces a benign atmosphere but does so in an economically and environmentally friendly way. In addition, it

directly serves as an instrument of on-the-spot pedagogy. This strengthens the sense of ownership and control of the school community, not just of the school premises, but of knowledge itself.

Figure 5.1.13 – Sustainable design strategies implemented in the school, Source: https://www.eastcoastarchitects.co.za, *http://www.angelabucklandphotography.com*

5.2.5 Material and finishes

Seven Fountains Primary School uses diverse materials, including natural materials, to create multiple sensory sensations in the school. It is also a more environmentally conscious school because of its water recycling schedule and solar voltaic panels.

The school's facade treatment is primarily hard-wearing and low maintenance materials: earth block walls and walls plastered and painted in earth colours, with descriptions of the elevation sections painted with community floor murals, concrete or stone paving, and metal handrails and bars. In the use of colours and textures, the use of various different materials brings the building to life changing the school experience positively.

Figure 5.2.14 – Façade Treatment of Seven Fountains School, Source: https://www.eastcoastarchitects.co.za

Figure 5.2.15 - Detail of the internal courtyard and the elevation of painted murals by the community, Source: https://www.eastcoastarchitects.co.za

5.3 Conclusion

Due to the difficult circumstances of the school's birth, and the school being charged with providing a new model for a rural primary school, while meeting with the departmental standards of accommodation, budget and size, the architects challenged the standard plans and typologies while engaging with the community throughout the design and decision-making process. The result is a well-resolved plan within a block which skilfully mediates the natural fall of the site and the curvilinear and orthogonal layout of the township while interacting with dedicated playgrounds and sports fields accessible to both the school and its community. The community involvement was key in the realisation of the school, the planning and scientific initiatives employed toward the provision of a comfortable and socially sustainable environment for both learning and teaching in the extreme climate of Kokstad, and the hybrid building of traditional and contemporary forms and materials.

It can be seen in that in terms of the theoretical framework set out in this dissertation that the desktop case study met the requirements. The school provides sufficient blended learning environments in order to empower the individual learners and promote social learning processes. The school has provided individual learning spaces, efficient group work opportunities, informal learning opportunities and technological support to effectively consider itself a centre for pioneering excellence. In terms of the micro-design of the learning spaces, the school has demonstrated an understanding of the learning process in order to improve the quality of educational outcomes in this day and age. These factors are significant contributors to positively impacting learning outcomes.

"The Seven Fountains Primary School is a wonderful example of what a community can do to help its children to educate themselves, together with its common goal," said Oprah (Seven Fountains, 2006).

Chapter 06 – Analysis and Discussions of Primary Data

6.1 Introduction

This chapter addresses questionnaires and interviews undertaken in rural education systems by professionals such as architects and planners, teachers or rural community representatives.

The COVID-19 19 regulations and prohibitions did not allow physical contact so the necessary number of interviews and questionnaires could not be carried out. Thus, consultations became important in order to gain insights into and solutions to respond to the rural co-urban situation of the municipality with co-operation staff in the Maphumulo and Mandini municipalities. The data collected by the municipalities provided guidance and answers to create a fitting design brief to represent the rural school of Mvumase. The approach will examine the role of architecture and the idea of place-based education through literature analysis on place-making and environmental activity, and child space education studies.

Ideas and values were often tested against precedents and case study in order to evaluate the necessary degree and methods for dealing with the rural school situation. This chapter would examine the most significant comments and opinions from polls and interviews. In this thesis the problem statement of that thesis is to be addressed and the main question of the thesis answered in literature review as well as in primary and secondary evidence.

6.2 Analysis of Research Findings

6.2.1 Introduction

Five questionnaires were sent out electronically, to Two teacher/community members in the local area, three architects/designers who have worked on rural schooling projects. The questionnaires are evaluated in various groups based on the priorities, hypotheses and principles, and literature review offering a vital understanding of how socially and architecturally the challenges found in rural schools are to be mitigated and effective interventions offered. Three questionnaires were conducted, to Two teacher/community representatives in the local region, three architects/designers who have worked on rural schooling projects. The interviews offer a critical glimpse into the psychological and architectural needs of rural school issues to be alleviated and appropriate interventions.

6.2.2 Community influence on the architecture of rural learning space

The participants were asked how significant the society has an effect on rural learning space architecture and what benefits it may have on community upliftment and education. They were asked whether the existing rural schools had an existing cultural presence and, if so, what impact it has on their existence.

'I don't feel there is any community involvement in schools, besides maybe some parents that take the initiative to come help out in school activities, but there is no community engagement.' – Community member 02

'People are living from hand to mouth as there is no resources or facilities to help build a community, there is a presence of the community, but the presence and spirit of the community is lacking and not thriving as there is no proper access to education, jobs and proper infrastructure.' – Educator 01

From the participants' answers, it can be concluded that the area has a sense of community, but that does not influence the architecture of the school. The

respondents conclude that the active impact of the rural school's architecture and its way of looking at a school can positively affect their lives.

6.2.3 The school is a place for social and economic opportunities.

'lack of resources and infrastructure hinders their growth.'- Educator 01

'I believe that children are the future of this country, and if we don't provide them with 21st century resources and methods of education then this country wont ultimately move from a 3rd world country towards a 1st world country. Therefore, if these primary schools were given better facility it will directly be linked to the building and empowering of the community, which in turn build this countries, economy and status.'- Architect 01

The evidence obtained from these reactions indicates that they believe deeply that rural areas and resources that promote social and economic development are in urgent need of the rural population. Rural areas are located far from economic resources, hence architecture that responds to these needs would help in empowering the population.

'The role of a primary school is very important for it is the base of a child's education, it is in this phase that they learn the basics and they need to have proper facilities that will provide the most integration between the learners and teacher. In term of improving socio economic conditions individuals' learners need to have a better education to for the social and economic factors, such as income, education, employment, community safety, and social supports can significantly affect how well and how long we as an individual live. These factors affect our ability to make healthy choices, manage stress, and more other factors in life.' – Community member 02

6.2.4 Community influenced facilities

The respondents were asked what facilities the community needed to be installed in the rural school architecture. The answers help to create an abstract design and to define the community's needs.

'More hands-on spaces, integrated natured spaces including spaces with nature to enhance the learning activity making it therapeutic and not stressful, having student to student peer review where students can express themselves freely to each other and have engagement without any stress, maybe even creating little pod spaces for students to have some alone time to revaluate on themselves whether it is 10 or 15mins.' – Community member 02

'Labs with advanced technology, community halls, skills development spaces, agriculture farming spaces, water harvesting spaces, sports facilities, retails spaces to empower and uplift the community.' - Teacher 01

'there is only one working computer, and this is unacceptable, as students and teachers need to be exposed to technology for them to thrive in the working environments and universities.' – Teacher 01

The respondents, for the greater part, urge comparable services to be incorporated in the rethink of a rural school. There are social, cultural, civil, schooling, leisure, technology, economic and cultural needs.

6.2.5 Physical design

Several respondents posed concerns of protection, adaptability for physical appeals and temperature. One respondent said he didn't think the school was a safe spot, 'pupils, travel distances alone crossing rivers and the potential, from harm from the weather, people and the environment, the school lack of sanitation also cause potential harm with regards to hygiene, the school itself is prone to vandalism, crime, and harm from other pupils on students, a lack of covered shelter, lack of handrails and clean safe environments cause harm physically.' - Community member 01. The respondents also suggest that the architecture of rural schools is sorely in need of imagination and that the schools lack local identification, conventional culture equivalent to 21st century schools. Therefore, to draw upon local use of content, culture and design language, a vital regionalist approach is required.

The success of a rural school will contribute to the link between design and site choices with physical activity and the creation of activity-friendly buildings. In consideration the form and the selection of a building design with respect to other building amenities, also the layout of spaces and the connection and linkages with other spaces having a flow through the building design is crucial. Also, the design layout of stairs, classrooms and emergency exits are vital. The physical design and its ability to use the site for pedestrian features as well as the relationship to off-site destinations are important to consider. In this case when encouraging learners, teachers, and the community to engage in physical activity to promote and enhance socio economic growth and development.

6.2.6 Micro city design

Herman Hertzberger talks about the school as a microcity, a group of streets and public squares for learning. These components work together to create a sense of identity within the school environment.

The respondents were asked if the learning spaces were adaptable in terms of the micro-design of the spaces, and only over half of the respondents agreed with a third that they were uncertain.

6.3 Municipal data collection analysis

6.3.1 Introduction

As Covid 19's legislation and limitations made it difficult to complete the necessary number of surveys and questionnaires, discussions were important to provide perspectives and solutions on the municipality's reaction to situation in rural co-municipality to provide further details in order to gather scientific information from key personnel in the Maphumulo and Mandini municipalities. The data collected from the municipalities provided a series of recommendations and strategies for the creation of a fitting design brief applicable to the rethink of a rural primary school.

Data has been collected and analysed from documents provide by the two respective municipalities, The Mandini Ward based plan (Ward 5), and the Maphumulo municipality municipal profile.

6.3.2 Analysis findings

Strengths • Natural resources • Natural water supply • Strong community presence	**Weaknesses** • Lack of formal housing • Poor maintenance of access roads • Lack of recreational facilities • High rate of unemployment • Lack of educational facilities • Lack of community amenities • Poor socio economic growth • Teenage pregnancy
Opportunities • Job creation • Life skills programmes • New model of education facility • Land and agricultural activities • Youth centre/Programmes	**Threats** • School drop outs • Poverty and unemployment • High birth rates

Figure 6.3.1- Swot analysis of the data provided, Source: https://www.mandeni.gov.za/index.php/documents, adapted by author

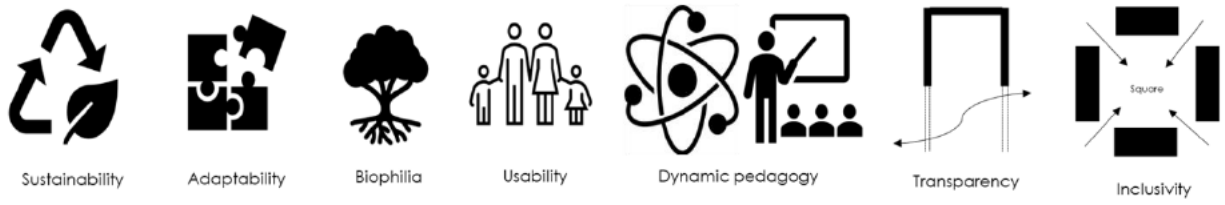
It must be combined with current rural fabric and clear ties to existing surrounding communities in order to achieve a learning facility that thrives in rural areas. The critical regionalism of Kenneth Frampton examines the relationship between the modern architecture and the current context. The emphasis is on the formation by comparing new technologies and geographical contexts and meaningful spaces and buildings. Smooth analyses of the given data (Figure 6.3.1) thus offer an insight into the social and architectural needs of rural school issues and appropriate interventions.

6.3.3 Needs based on the SWOT analysis

Data has been collected and analysed from documents provide by the two respective municipalities, The Mandini Ward based plan (Ward 5), and the Maphumulo municipality municipal profile.

Recreational	Basic community needs	Civic, economic	Educational
• Sports fields • Arts and culture centre	• Clean running water • Electricity • Sanitation	• Housing • Job creation • Health care • Postage services • Community gathering space • Satellite police station • Market space	• School • Community literacy development • Library • Skills development Centre

Figure 6.3.2-Community needs as per The Mandini Ward based plan (Ward 5), and the Maphumulo municipality municipal profile, Source: Author



Source: Author Figure 6.3.3-Design drivers

'Rural sustainable development is based on the socio-economic, political and physical advancement of rural areas' (Jiwane and Sanyal, 2013). Such development should be driven primarily by the community, culture, business, public health, education, technology and climate. The development and empowerment of human resources is important with regard to psychology, knowledge, intellect, mindsets and other capacities. Development cannot be carried out without the provision of basic facilities, including drinking water, electricity, education, transport, etc. The role of local institutions and their role in promoting growth objectives to promote growth is important to understand.

Schools are both a rural development aspect and a development icon (Nelson Mandela Foundation, HSRC Press, 2005).

The provision of school facilities is regarded by communities as integral to developing childcare, education and the environment. In order to enhance

the environment, a well-designed community school that seamlessly meets the needs described in Figures 6.3.2 would increase the standard of schooling and the quality of life. Both research sites were concerned with communities missing basic infrastructure: water, power, bridges, hospitals, quality schools and community halls. This constitutes the 'practical social' needs of societies. Schools are used for a host of other than education reasons. They are important for adult education as a collective resource.

6.3.4 Vision and objectives of the Municipality

6.3.4.1 - Vision

By 2021, the municipality aims to partner with the youths and to work hard to reach their desires by funding the services in the city which are available to help decrease the incidence of violence and pregnancy.

'We want to be a sustainable community that has got a good development in our area, the community facilities that are in a good level standards, as well as having good roads and community infrastructures that are listed on the community needs criteria' (Mandeni.gov.za, 2017)

6.3.4.2 - Objectives

The municipality, dedicate themselves to the goals of service delivery for all communities in the ward by the following conduct modes:

- **Water and electricity**

To enhance basic livelihoods, i.e. water, power and resources by engaging partners and establishing project strategies for enhancing the installation and retention of these facilities through closer contacts with the municipality.

Improving living conditions with basic utilities such as water, sanitation, waste and electricity

- **Education**

To do anything to increase the accessibility and standard of schooling and to engage citizens and experts in promoting the reform of education and upliftment in rural areas.

- **Economic Development**

To mobilise the community around SMME's and cooperative growth with the goal to minimize and boost economic development and collective trade in the area, build more employment, establishment of a village market to ensure capital preservation, increase the quality of living and improve the level of self-regard of the community.

- **Sports and recreation**

Funding for good sports and leisure programs and close collaboration with external partners in the region.

Based on the civic vision, a well-structured rural school that satisfies the students' pedagogical needs as well as the socio economic and cultural empowerment may be considered an important benefit for that community and will serve to better the lives of many and achieve its objectives. The analysis of municipal goals and vision will also help to develop a set of community needs guidelines and how this is achieved and how the structure can respond to this.

6.4 Conclusion of Analysis

The questionnaires and interviews revealed that the community's potential to improve quality of education and socio-economic circumstances in South Africa is undisputed.

The main data obtained through interviews, conversations, questionnaires and visual observations is essential for understanding core ideas and theories in this dissertation and serving as a path forward in the planning of the rural communities. Rural community lifestyles are commonly misunderstood and

have contributed to architecture that does not adapt to their needs. How they influence and affect the lives of the rural population has been demonstrated by the importance of studying architecture and urban environments.

The municipal data suggested that the government has placed in place policies to help rural communities fulfil their role in improving socio-economic conditions in South Africa and provided the author with key insight into where the existing rural education and community stands and informs the design principles that the author will incorporate in the design. Corruption problems and a lack of understanding of the effect of the built environment on the quality of educational results and on improving the image of these institutions are still present, which undermines this mechanism. Despite this the review of the policies adopted by the municipalities will help to define the community's needs and create a more informed brief. The built environment plays a huge role in empowering education and communities, and it therefore needs to be invested in to not only change the stigmas surrounding rural schools and to enhance learning outcomes, but also to enable a philosophy and a vision in reality.

Chapter 07 – Conclusion and Recommendations

7.1 Introduction

The purpose of the research was to understand the problem related to the impact of the community in the rural context and in turn, in society, on the architecture of learning spaces. The main objective and correlated goals of the study were stated in the introductory chapter, which determined the main question and the correlated sub-questions. To assess the results of the analysis and to prove or disprove the hypothesis, this section will revisit these elements. Finally, in order to build a context of understanding as to how the built environment can motivate the rural community of Mvamuse and enhance the quality of education, this section will outline a range of principles for rethinking a rural primary school.

7.2 Responding to the aim and objectives

Aim

The aim of this research was to interrogate how architecture and the built form, can enhance rural education and the surrounding communities and help them create a self-sufficient community, by studying the influence community has on learning space in rural areas, in order to develop a set of architectural principles for contextually responsive design of rural primary schools.

The goal of this study was accomplished by demonstrating the potential for the learning process and culture that community impact has on the school-built environments. This is achieved by using the entire environment created by the school.

Objectives

- To research the current state of rural schools to understand the shortcomings of the architectural design of rural primary schools.

In Chapter 2 this was done. The author has studied the existing state of the rural education system and identified various issues that need urgent attention within the South African education system. In the other hand, other areas of concern such as ethnic and class socioeconomic disparities, amid numerous multiracial educational institutions, suggest that the population of South Africa needs more time to fully neglect apartheid mentalities and attitude.

- Research the rural community needs to inform a responsive architectural strategy for rural primary schools.
- To understand how architecture can enhance the social relevance of rural primary schools and create a self-sufficient community.
- To understand how the built environment can respond to the pedagogic requirements of rural primary schools.
- To develop a set of architectural principles for the sustainable development of community-responsive rural primary schools.

The precedent studies were the foundation for the accomplishment of the targets, as the studied schools included spaces both made up and used every day for teaching and learning. When combined with local teachers, community members and architects, these elements contribute to the concept of new architectural values for a school which incorporates community spaces into a rural mode of schooling.

7.3 Conclusion to research

From the study performed in this dissertation, it can be inferred that rural schools in South Africa do not have the influence of the community required to boost education and learning and overall upliftment of the entire community. These schools prefer to adhere to the school conventional teaching approach that ignores the involvement of the community, whereas a well-established country school that reacts not only to the pedagogical needs of the pupils, but also to the empowerment of social economies and societies can be treated as a significant advantage for this community and can make a significant

difference in many lives. This was illustrated by data gathered from primary and secondary sources. The core principle of school learning environments can be utilized by the spatial planning and architecture of planned and unbuilt places, and by integrating classes in instructional activities. It will become an ecosystem in which students and the group can grow to a deeper understanding and respect of each other and their environments. This dissertation investigated how architecture and built form can improve rural education and uplift the local community and enable it to create a self-sufficient community by exploring the effect the community has on the rural learning region in order to develop a collection of architectural concepts for the contextually responsive design of rural primary schools. Study success can also be strategically used within the non-academic environment to consider the effect of society on rural-school architecture and inspiring education in South Africa's socio-economic problems.

The results of this study can not only be used to draw on the existing knowledge of the subject but also to examine the role of the architect in helping to construct a motivated community in the built environment.

7.4 Recommendations and Key findings informing a responsive architectural design

7.4.1 Introduction

In this dissertation, this section will make recommendations based on this research in order to improve the quality of education and uplift the community in the rural context and to inform the design of a rethink of a rural school. The recommendations would formulate a collection of guidelines consisting of the subsections used as the theoretical context for evaluating the site's precedent and desktop analysis to set a benchmark for the proposed construction and for potential developments of rural education facilities in the built environment.

The goal of the literature review was to examine the rural community's context and provide an insight into their lifestyles and requirements. This has shown reasons why Design often fails to solve rural education issues, these factors will

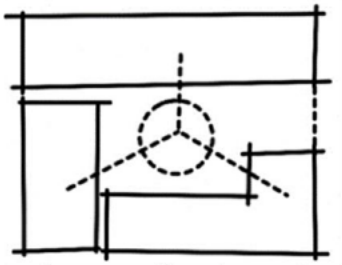
be taken into account and implemented to help mitigate the problems found in rural schooling in the selection of sites and the curriculum to be implemented in the program in a rethink of a rural school architecture. The recommendation would also make use of the guidelines for rural schools set out by the Department of Education so that this analysis can be added to the Municipality's guidelines to assist with the problem in rural schools.

Philosophy and Vision - In the rural background, the vision of a primary school with community impact should be focused on the role played in allowing learners and the community to contribute to the socio-economic progress of the country's growth. Theory should also contain main concepts such as discipline, teamwork, participation, and efficacy. Professionalism is reflected in elements like honesty, commitment, and integrity. Teamwork includes elements such as equal rights, tradition, and teamwork. Engaging shall include elements such as reactivity, integration, and communication. Quality includes factors such as systems, relevance and results-oriented encouragement.

Educational and training guidelines - Spaces should discuss and promote the development of skills to be ready for work. The social services of the shelter must be community-oriented, in order to facilitate the rehabilitation back into society. They may also be motivated by the kinds of programs that earn money and help to direct life.

Person centred - The positive growth of the individual is necessary to remember. This can be accomplished by incorporating and accommodating human needs within a community. The facility must permit the person to cultivate and facilitate their well-being. Adequate use of architecture can be used to conform to individual sizes and to create spaces for interaction and reflection.

- Promotes sense of comfort.
- Creates improved accessibility
- More social interaction.
- Provides a sense of safety & security
- Allows for greater physical activity.
- Gives a space its own identity.
- Establishment of mini-communities



- Form creating place. Connecting the place
- Sense of security. Distinct place.
- Defined place.

Figure 7.1 Characteristic of person-centred approach, Source: Author

Community centred - The facility should provide for services to meet the community's growth. The utilization of community-based services will enhance community involvement. City centre, hospital, mail, farm and cultural room spaces offer support and civic contribution to rural areas.

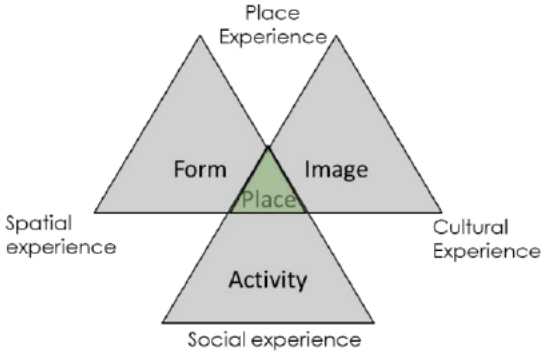


Figure 7.2 Characteristic of Community-centred approach, Source: Author

Design process - The design process should combine the values that the philosophy retains to cement the philosophy of the school through development. The design process should be a simple approach which involves the enterprise, the faculty and the students as much as possible in order to allow the philosophy of the school to be embedded in the design process by citizenship. That will make ownership and a sense of belonging possible.

Response to Natural Environmental Site Features - It should consider and respond to the characteristics of its location for the specific nature of an architecture. For this report, the concept of focusing on rural primary school, with prominent use of green spaces should include as many natural features as possible. This facilitates environmental learning and instruction, and also preserves ties to the existing context of the site and its characteristics and hence prevents place lessness.

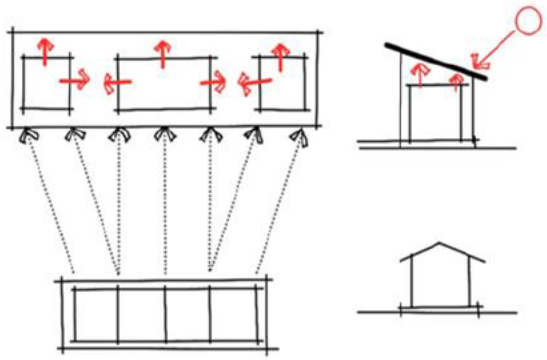


Figure 7.3 Climatic response, Source: Author

The use of various materials, including natural materials found in and around the city, to create various sensory experience within the classroom.

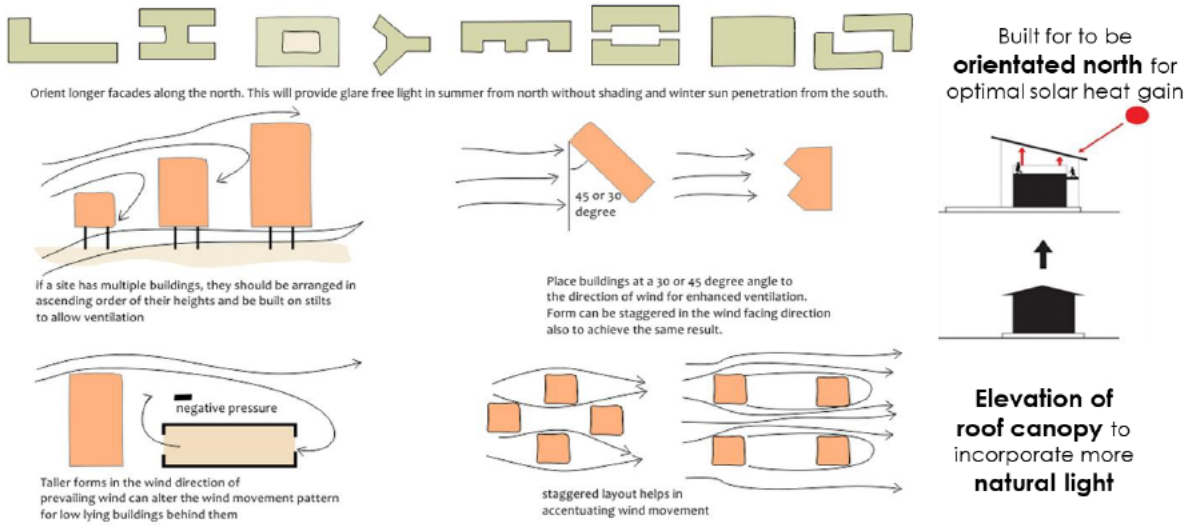


Figure 7.4 Climatic response, Source: Author

The façade treatments of the school are mostly hard-wearing and low maintenance: earth-block walls, earth-painted and painted walls, with details of the elevations painted with community murals, concrete or stone pavement, and metal handrails and bars. The utilization of colours and textures contributes to a meaningful improvement of the school environment.

Figure 7.5 façade treatment, Source: Author

Location -

- North orientation
- Pedestrian access
- Service road
- Private / public layering
- Proportion of spaces on site
- Natural water supply
- Space for expansion of facilities
- Community presence
- Availability of agricultural land
- Site topology to lend itself to spatial hierarchy
- Site to lend itself to sustainable design principles
- Opportunity for economic growth
- Site to lend itself to place based education principles
- Biophilia
- Walkability
- Lack of community amenities and basic facilities

Figure 7.6 Site criteria, Source: Author

The School as a Micro-city - The definition of school as micro-city by Herman Hertzberger provides many possibilities for social connections, simple monitoring and navigation, as well as a relation between constructed and unbuilt forms. The idea of school is defined as a suggestion to revise rural school architecture. This is the cornerstone of the design proposal as it lays the foundations of the architecture of the school building and of the areas created 'between' buildings.

Expansion & Flexibility - Conventional classes should be flexible to be able to tackle current overcrowding challenges and respond to after-school lessons and activities. This expansion will also facilitate place-based education by integrating the principle of proximity and connectivity of green spaces and community needs. Learning contexts need to be adaptive to an ever-changing environment. This feature makes rooms change and make improvements. It allows diverse types of instructional strategies in a learning system to be defined and administered.

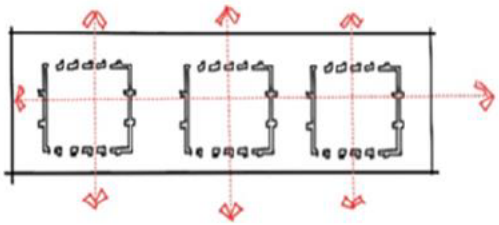


Figure 7.6 Classroom expandability, Source: Author

Child-orientated Environments - Based on the argument that educational environments should not be just educational places, school spaces should make students feel comfortable and part of the creation, organization, and intent of these environments. Constructed and unconstructed areas devoted to learning or to social interaction among students build a healthy community through which students may develop true sense of location, ownership and belonging. This definition works in line with Sensory Heterogeneity in designing the types of spaces created within the school environment.

7.5 Conclusion

The recommendations are combined to provide a framework for establishing community-based educational facilities in the rural development sector. This will help design a proposed rethink for the rural primary school for the rural North Coast.

A design study on the proposal to revise the rural North Coast primary school integrates common concerns as core characteristics used to improve the learning atmosphere and neighbourhoods. The following chapter concluded the research review.

Appendix i (Informed Consent Letter)

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

APPLICATION FOR ETHICS APPROVAL

For research with human participants

INFORMED CONSENT RESOURCE TEMPLATE

Note to researchers: Notwithstanding the need for scientific and legal accuracy, every effort should be made to produce a consent document that is as linguistically clear and simple as possible, without omitting important details as outlined below. Certified translated versions will be required once the original version is approved.

There are specific circumstances where witnessed verbal consent might be acceptable, and circumstances where individual informed consent may be waived by HSSREC.

Information Sheet and Consent to Participate in Research

Date: 10 October 2020

Greeting: Mr/Miss/Ms Participant.

My name is Neeshailin Sutheeva Naicker, I am a Master Student from the University of KwaZulu Natal (Howard College Campus), Department of Humanities. My Contact Number is (072 017 1038) and my email addresses are as follows: (neeshailin@gmail.com/214549196@stu.ukzn.ac.za)

You are being invited to consider participating in a study that involves research the influence of the community on the architecture of learning spaces in rural primary schools. The aim and purpose of this research is to interrogate how architecture and the built form, can enhance rural education and the surrounding communities, by studying the influence community has on learning space in rural areas, in order to develop a set of architectural principles for contextually responsive design of rural primary schools. The study is expected to enroll 30 participants in total, in two other sites in KZN. It will involve the following procedures, a questionnaire and short interview, followed by data collection. The duration of your participation if you choose to enroll and remain in the study is expected to be 2 months. The study is funded by me.

The study will involve no risks and/or discomforts. The topic is important because a failing education system is highly detrimental to the long-term future of the state. From an architectural perspective, the author is motivated by exploring this relationship between communities, education and the built environment in order to contribute to resolution of this problem. Existing rural education facilities in South Africa are predominantly designed to be introverted institutions which ignore the power that society and community can have on learning outcomes.

The outcomes of this research may be used not only to expand on the knowledge existing on the subject but also to investigate what the role of the architect is in contributing to the development of an empowered society through the built environment.

If the research will involve no risk. This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number HSSREC/00002039/2020).

In the event of any problems or concerns/questions you may contact the researcher at:

(072 017 1038) and my email addresses are as follows:

(neeshailin@gmail.com/214549196@stu.ukzn.ac.za) or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

The participation in this research is voluntary and the participants may withdraw participation at any point), and in the event of refusal/withdrawal of participation the participants will not incur penalty or loss of treatment or other benefit to which they are normally entitled. There is no consequences to the participant for withdrawal from the study and the procedure/s required from the participants for orderly withdrawal is to simply contact the researcher informing their withdrawal.

There are no costs be incurred by participants as a result of participation in the study. There are no incentives or reimbursements for participation in the study, state how much and why they will be given.

Describe in detail the steps that will be taken to protect confidentiality of personal/clinical information, and the limits of confidentiality if applicable. Describe the fate of the data and stored samples.

CONSENT

I _____have been informed about the study entitled the influence of the community on the architecture of learning spaces in rural primary schools. The rethink of rural primary schools, by (Neeshailin Sutheeva Naicker Student at the University of KwaZulu Natal Howard College - Student Number 214549196).

I understand the purpose and procedures of the study.

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at 072 017 1038 or at her email neeshailin@gmail.com.

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557 - Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview / focus group discussion YES / NO

Signature of Participant	Date
Signature of Witness (Where applicable)	Date
Signature of Translator (Where applicable)	Date

Appendix ii (Fieldwork Interview Type 1)

Focussed Interview |

This focussed interview questionnaire is aimed at gaining the insight of the executive personnel who are involved in the design and/or management of the facility and/or building users. The questions are based on the data received back from the general questionnaires in order create an informed discussion around the issues raised in the questionnaire.

Interview Date, Time and Venue:_____

Interviewee Name and Occupation:_____

1. What do you believe is the role of primary schools in terms of empowering individual learners, and in terms of improving socio-economic conditions in in the rural community?

_____
_____
_____

2. Do you believe that the school enables this to the best it can?

_____
_____
_____

3. What facilities/spaces would you like to see integrated in a rural school?

_____
_____
_____

4. Is there any community influence in the school?

_____
_____
_____

5. How does this affect the learning spaces within the school?

6. How highly do you rate the quality of the learning environments?

7. How does the location of the school contribute to its success?

8. How does the physical design contribute to its success?

9. Is there a sense of community within the local area?

10. What do you believe is society's perception of the school?

11. How do you think that the perception of the school can be improved?

_____

_____

_____

12. How do you think the quality of education in the school can be improved?

_____

_____

_____

Thanks very much for your input in this research, it is greatly appreciated.

Appendix ii (Fieldwork Questionnaire Type 1)

Anonymous General Research Questionnaire |

This general research questionnaire is anonymous and aims to gain various opinions from the learners and/or educators of the facility in order to better understand how the built environment is contributing to the empowerment of education.

Date:_____

Questionnaire Reference Number:_____

Gender:_____Race:_____Age_____

SECTION 1: PARTICULARS OF QUESTIONNAIRE RESPONDENT

What is your educational background?

a. No Formal Schooling

b. Grades 1- 9

c. Matriculation

d. Tertiary Education

e. Other (Please specify)

_____

What is your role within the Community?

f. Learner

g. Educator

h. Management

i. Other (Please specify)

_____

SECTION 2: QUESTIONNAIRE STATEMENTS

The following are statements about the community and the process of learning and/or teaching. Please make a mark next to the most appropriate answer.

There is space below each statement for any further comments you wish to make with regards to the statement or to validate your answer.

1. Community influence can improve the curriculum in rural primary schools.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

2. What facilities/spaces would you like to see integrated in school?

Comments: _____

3. There is a focus on the individuality of learners and on social learning.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

4. The school and surround area has a sense of community.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

5. The school is easily accessible to me in terms of its physical location.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

6. The school is a place for social and economic opportunities.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

7. The school is a safe environment.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

8. The school is a place that I want to spend as much time as possible at.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

9. The school is visually appealing to me.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

10. The learning spaces are adaptable to changing learning, spatial and community needs.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

11. The furniture is comfortable in the learning environments.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

12. There is enough technological support the learning and community needs.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

13. Climatic conditions have been taken into account in existing community buildings.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

14. There is running water and electricity provided by to the community.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

15. A well-designed community schooling facility would be beneficial to a rural area.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

16. Community upliftment facilities are easily available to the community.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

17. Are there facilities that for the community to learn new skills?

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

18. According to the public, the perception of the school is positive.

□ Strongly Agree □ Agree □ Unsure □ Disagree □ Strongly Disagree

Comments: _____

Appendix iv (Ethical Clearance Approval Letter)

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

30 October 2020

Mr Neeshailin Sutheeva Naicker (214549196)
School Of Built Env & Dev Stud
Howard College

Dear Mr Naicker,

Protocol reference number: HSSREC/00002039/2020
Project title: The Influence of The Community on The Architecture of Learning Spaces: The Rethink of a Rural Primary School
Degree: Masters

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 25 August 2020 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL** on the following condition:

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 30 October 2021.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,

[redacted]

Professor Dipane Hlalele (Chair)

/dd

Humanities and Social Sciences Research Ethics Committee
Postal Address: Private Bag X54001, Durban, 4000, South Africa
Telephone: +27 (0)31 260 8350/4557/3587 **Email:** hssrec@ukzn.ac.za **Website:** http://research.ukzn.ac.za/Research-Ethics
Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

INSPIRING GREATNESS

Figure: Ethical Clearance

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Part B

Design

Part B

Design

The Influence Of The Community On The Architecture Of Learning Spaces : Towards Rethink of a Rural Primary School

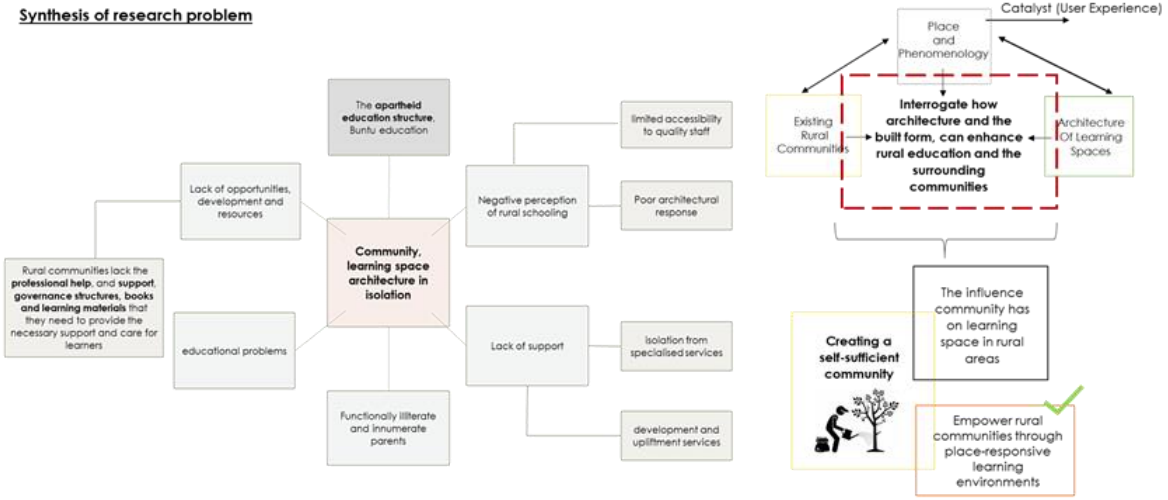
Introduction

A school makes a community, it is the binding element that keeps the community together. Malhoit (2005, pp.10) elucidates:
"The school is the most important public institution in a rural community, a rallying point for services to poor families and children, a polling place, the library, and the community centre. Rural schools also represent the economic lifeblood of the community."

Problem statement / Definition of problem

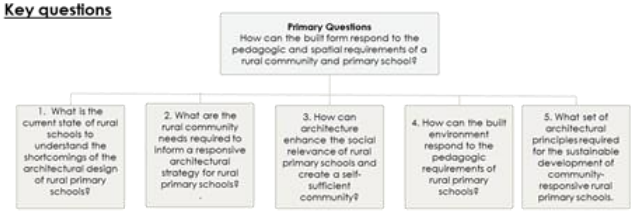
The general state of rural education facilities has a negative effect on the overall standard of education that can be provided. Research suggests, rural community has an impact on learning spaces, however this impact has not been implemented architecturally in rural schools, in order to create an empowered education as a catalyst for the spatial transformation of rural communities in South Africa..

Synthesis of research problem

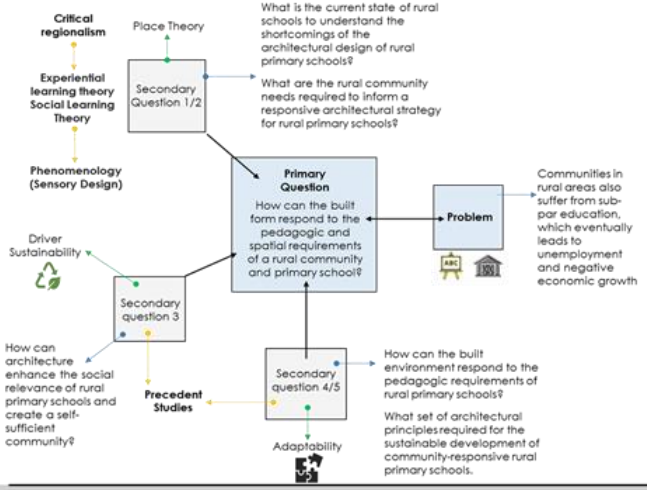


Architecture as a catalysis for creating a strengthened community/school relationship

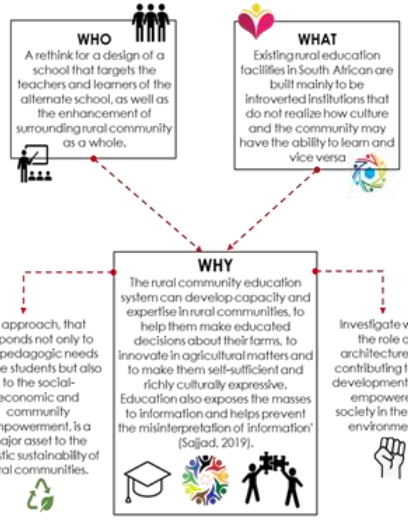
Key questions



Synthesis of Research questions



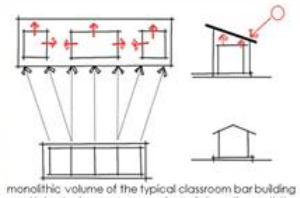
Motivation and justification



From an architectural perspective, I have been motivated by exploring the vital relationship between communities, education, and the built environment to contribute to the resolution of this problem through architecture.
It is therefore argued that a much more considered architectural approach, that responds not only to the pedagogic needs of the students but also to the social-economic needs of the community, can be seen as a major asset to the holistic sustainability of rural communities.

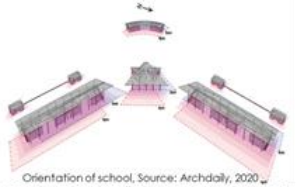
Precedent studies

Chipakata Children's Academy, **Architects** - Susan Rodriguez + Frank Lupo + Randy Antonia Lott, **Location** - Lusaka, Zambia, **Year** - 2015



monolithic volume of the typical classroom bar building and introducing open space for collaborative activity between classrooms, Source: Author

Community gathering space at Chipakata, Source: Archdaily, 2020

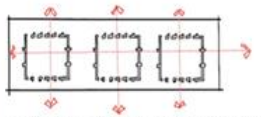


Orientation of school, Source: Archdaily, 2020

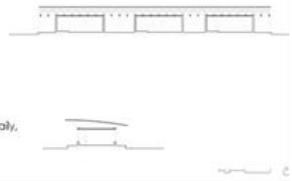
- Sensitivity to **addressing climate** and **sustainability** through the building
- **Sense of place** and created a connection between the **school and community**
- Waldof pedagogy
- **Cheap, hard-wearing** and **low maintenance** materials
- **Integration of community facilities**
- A community gathering space
- **All materials locally procured**

Primary School in Gando, **Architects** - Kéré Architecture, **Location** – Burkina Faso, **Year** – 2001

Materiality of Gando Primary School, Source: Archdaily, 2016



Plan of Gando Primary School, Source: Archdaily, 2016,adapted by author



Materiality of Gando Primary School, Source: Archdaily, 2016

- Close **involvement** of the **local** villagers
- Clay/mud hybrid construction
- **Sustainable design principles**
- Critical regionalism
- **Spatial adaptability**

7 Fountains Primary School, **Architects** - East Coast Architects, **Location** - Shayamoya, Kokstad, Kwa – Zulu Natal, **Year** – 2007

Main Public Square of Seven Fountains School showing the implementation of steps and folly like structures, Source: https://www.eastcoastarchitects.co.za

MASTER PLAN

Volumetric experience of Seven Fountains School, Source: https://www.eastcoastarchitects.co.za, adapted by author

Earth building under construction , Source: https://www.eastcoastarchitects.co.za

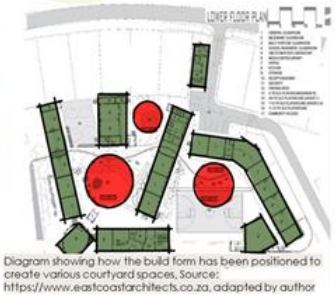


Diagram showing how the build form has been positioned to create various courtyard spaces, Source: https://www.eastcoastarchitects.co.za, adapted by author

- Sensitivity to **addressing climate** and **sustainability** through the building
- **Sense of place** and created a connection between the **school and community**
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- Clay/mud hybrid construction
- **Sustainable design principles**
- Critical regionalism
- **Spatial adaptability**

Neeshailin S Naicker 214549196

Place theory

Critical regionalism

Sustainability

Spatial adaptability

Phenomenology :Sensory Architecture

Theoretical and conceptual framework

Built environment and perception

Environmental Psychology: Built environment affects users

Facilities that uplift the standard of living in Community

Inclusivity

Experiential learning theory: Learn through experience

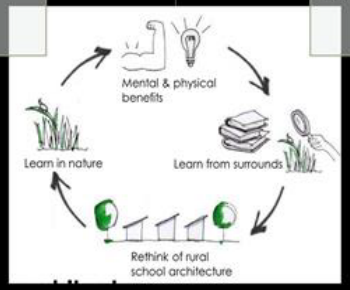
Learning through community interaction and sharing

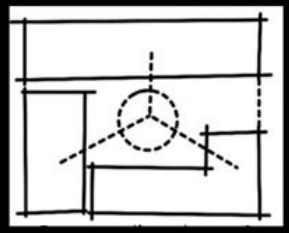
Waldorf Pedagogy: Development of the child as well as to educate the whole child

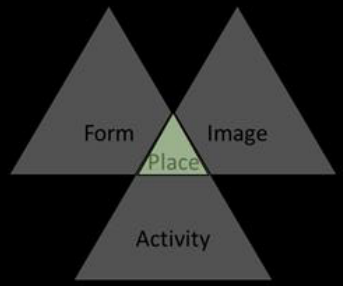
Social Learning Theory

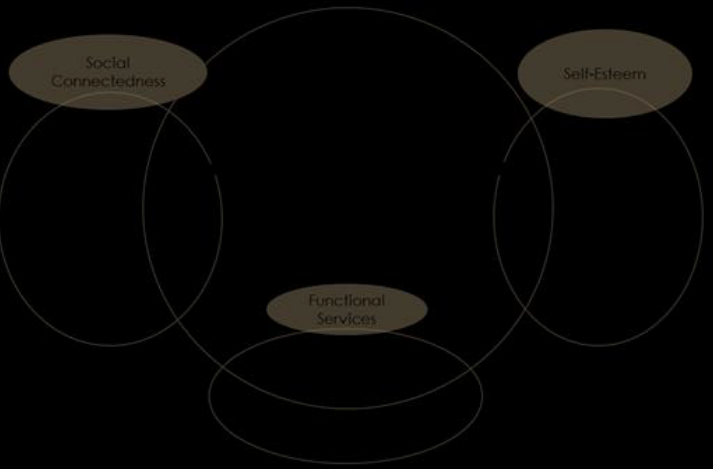
Biophilia - Nature and man

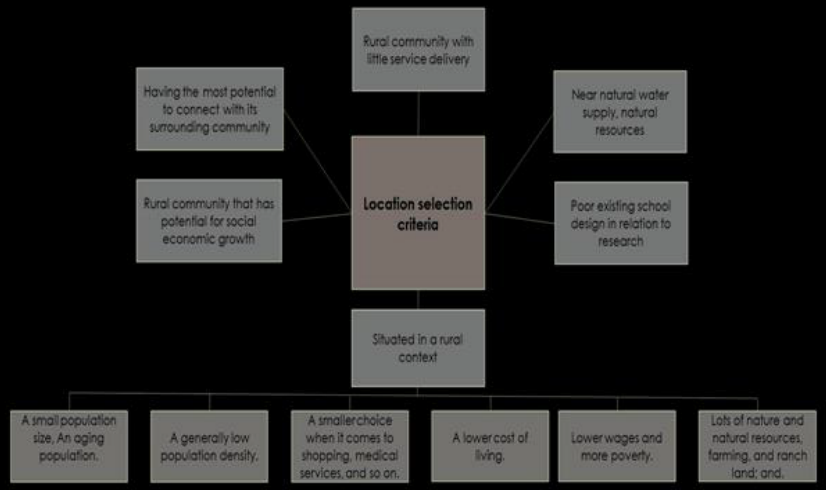
Place-Based Education: Learn through place










Rural community with little service delivery
Having the most potential to connect with its surrounding community
Near natural water supply, natural resources
Location selection criteria
Rural community that has potential for social economic growth
Poor existing school design in relation to research
Situated in a rural context
A small population size, An aging population.
A generally low population density.
A smaller choice when it comes to shopping, medical services, and so on.
A lower cost of living.
Lower wages and more poverty.
Lots of nature and natural resources, farming, and ranch land; and.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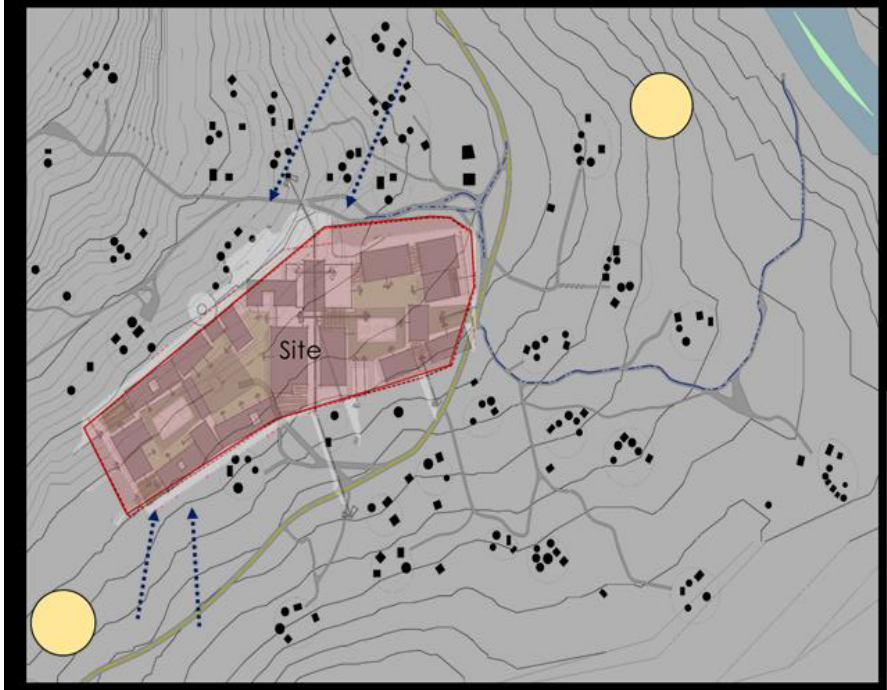
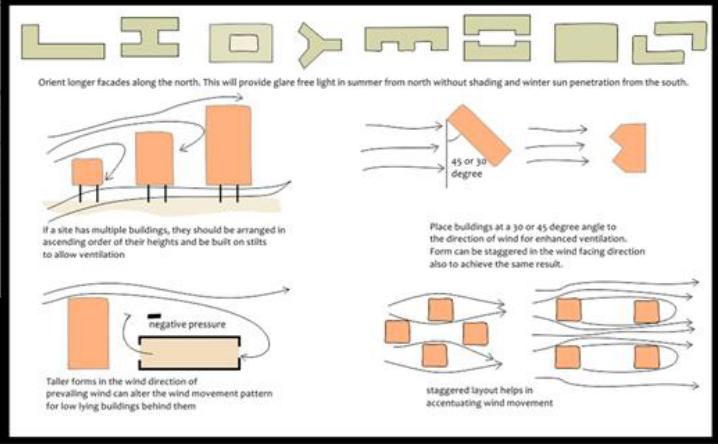
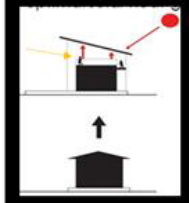
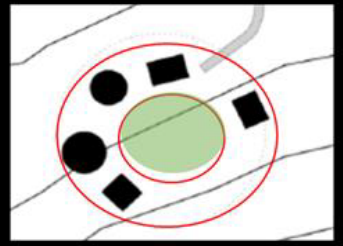
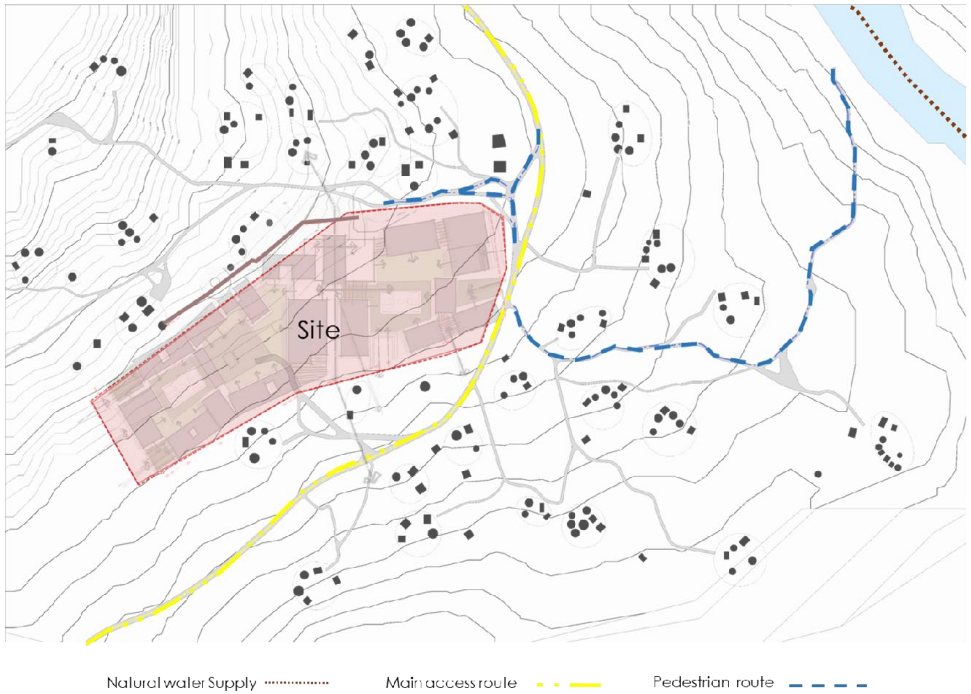

Site

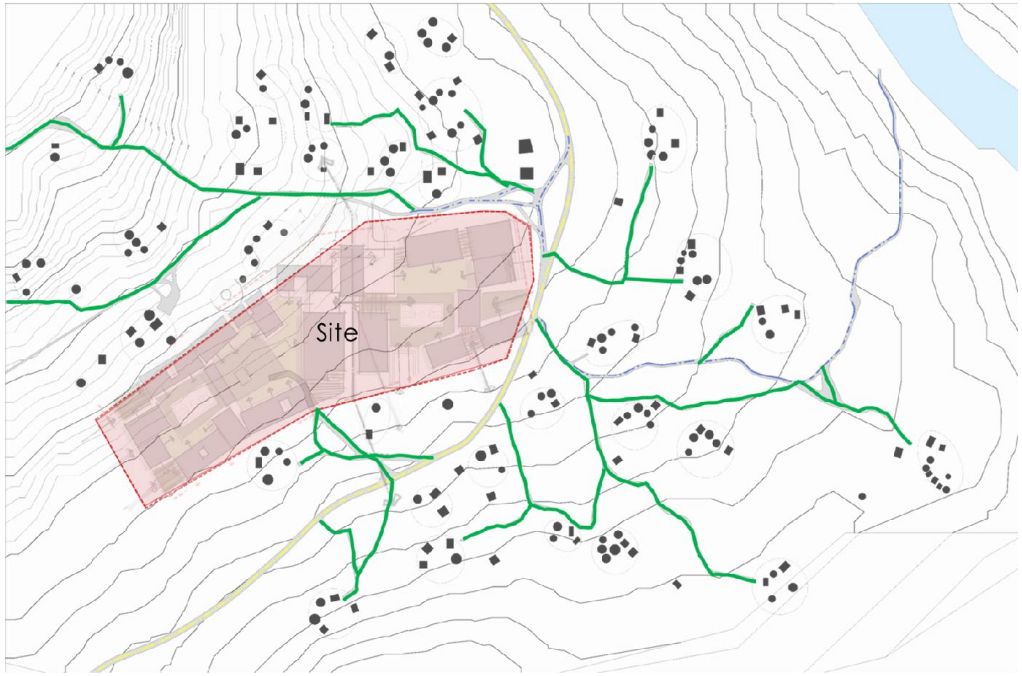

Orient longer facades along the north. This will provide glare free light in summer from north without shading and winter sun penetration from the south.
If a site has multiple buildings, they should be arranged in ascending order of their heights and be built on stilts to allow ventilation
45 or 30 degree
Place buildings at a 30 or 45 degree angle to the direction of wind for enhanced ventilation. Form can be staggered in the wind facing direction also to achieve the same result.
negative pressure
Taller forms in the wind direction of prevailing wind can alter the wind movement pattern for low lying buildings behind them
staggered layout helps in accentuating wind movement

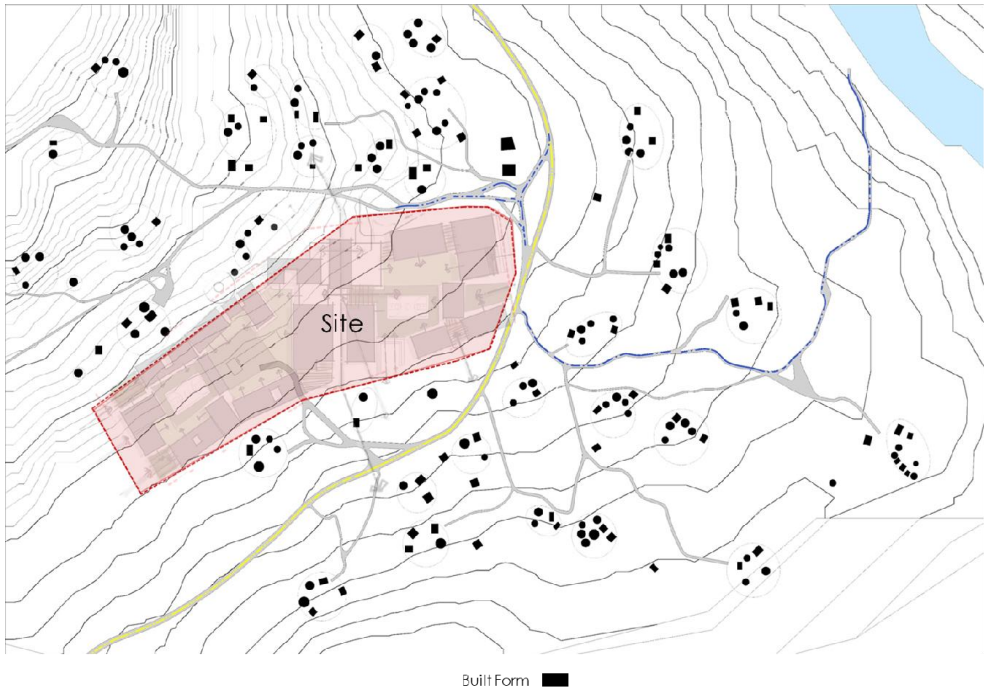


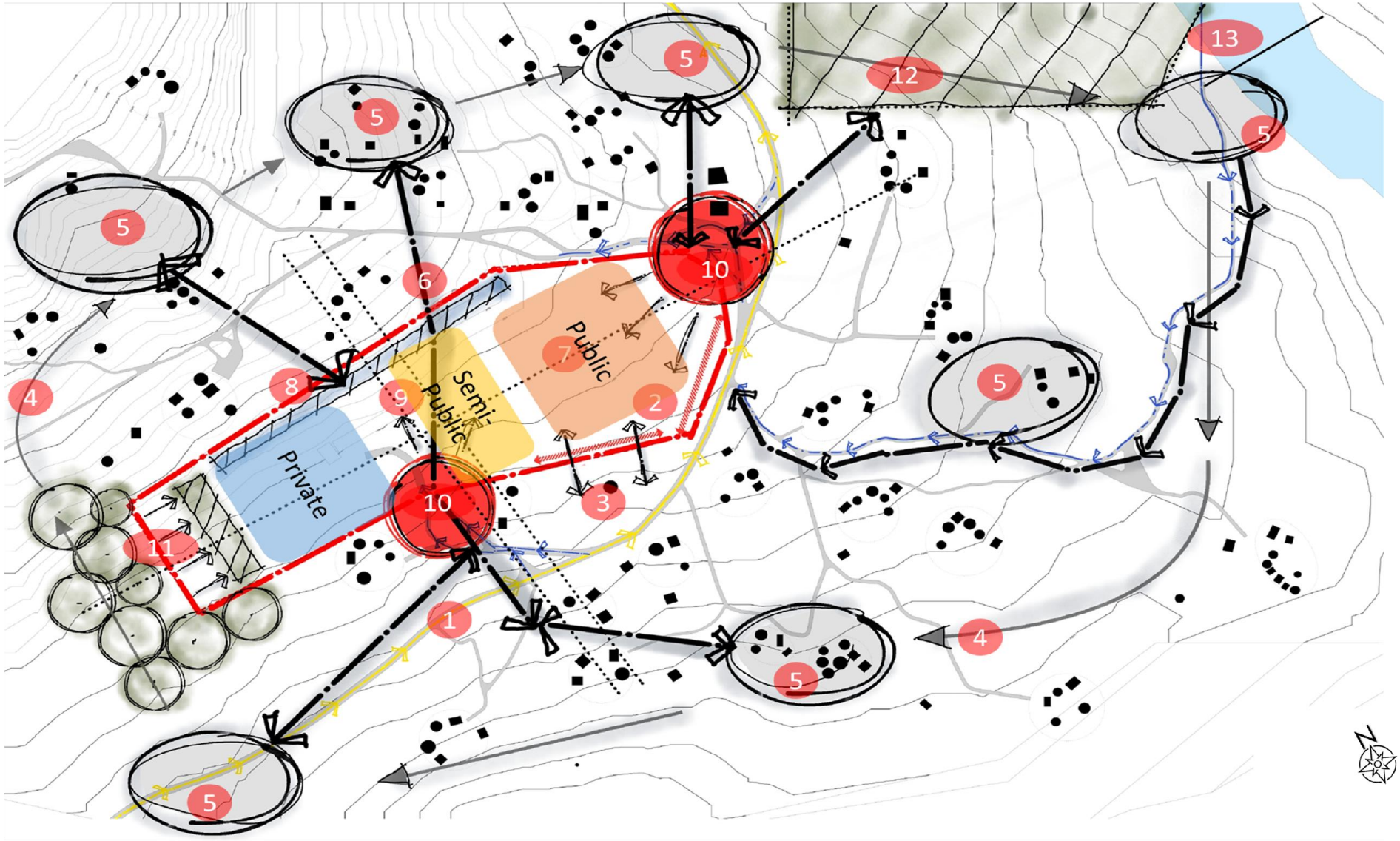



Site
Green Open Space


Site
Natural water Supply
Main access route
Pedestrian route


Site
Secondary route


Site
Built Form



1 Main transport route

2 Hard edge

3 Site set back to create buffer

4 **Interconnection of community creates a sense of place, Place theory**, sense of place

5 Linkage of community note, **Social connectiveness**

6 **Natural pedestrian thoroughfares** through site

7 **Movement** patterns influence **primary public space**

8 **Soft edge**, natural surveillance, **safety**

9 **Buffer** between **semi-private and private**

10 Intersection of movement patterns to create **nodes**

13 Natural water source

11 **Green area** filtering on to site to promote **biophilic** and **experiential learning**

12 Natural farm lands

Brief

Clients

education
Department of Education
REPUBLIC OF SOUTH AFRICA

ASIDI
Accelerated Schools Infrastructure Delivery Initiative

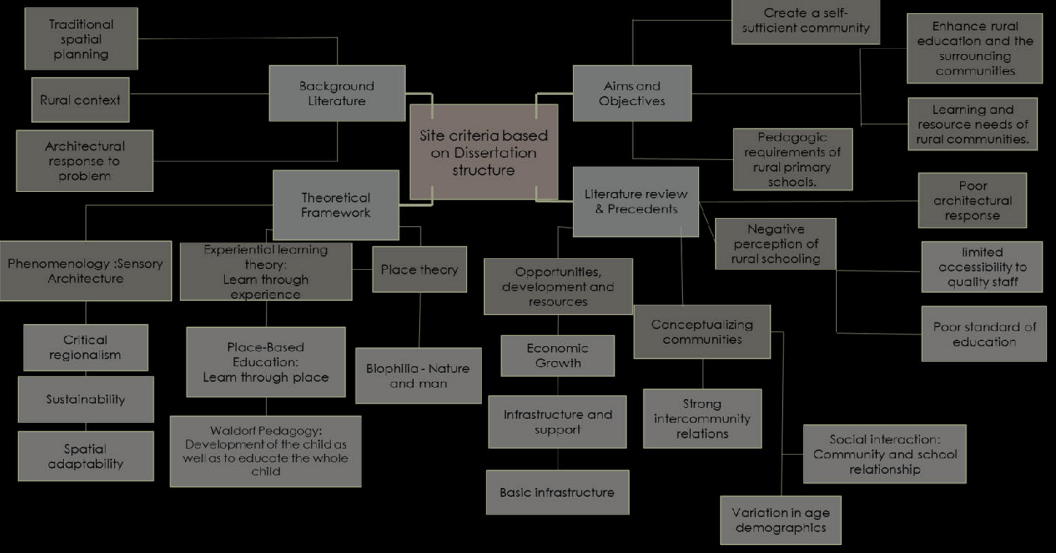
User

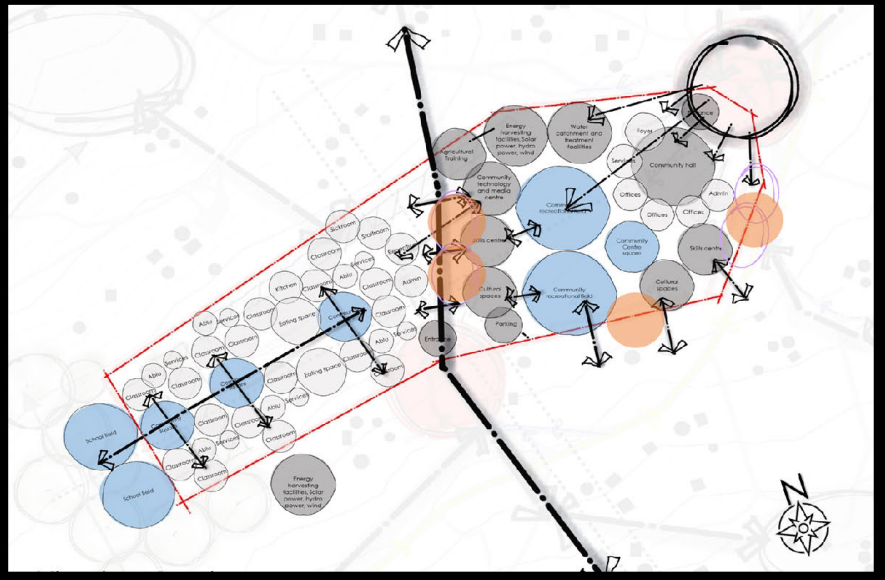
EDUCATIONAL SPACES	Unit size m²
Classrooms	80
Grade R facility	120
Science laboratory	120
Social Science rooms	120
Computer rooms	80
Arts and Culture room	120
Multipurpose room	80
Technology room	80
Media Centre	120
Storage spaces	15
Agricultural Management Practices room	120
Agricultural Technology room	120
Agricultural Sciences room	120
Dance Studies room	120
Design room	120
Dramatic Arts room	120
Music room	120
Visual Arts room	120
Library	100

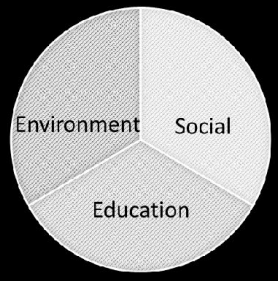
ADMINISTRATION SPACES	Unit size m²
Principal's office	20
Deputy Principal's office	15
Administration office	20
Reception area	15
Ablution facilities for educators	1.8/E
Storage areas/spaces	15
Strong room	10
Printing room	15
Staff room	60
Pastoral care rooms	
1. Sick rooms 2. Counselling rooms	15 15
Heads of Departments offices	15
Kitchenette	20

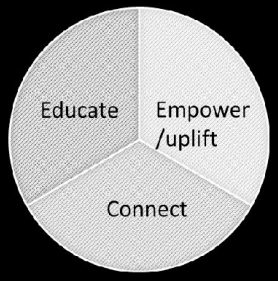
Support spaces	Unit size m²
Food Garden	100
Tuckshop	15
Kitchen	20
Nutrition centre/Food storage	15
Eating space(multipurpose)	120
Security room	10
General purpose hall	100
Sports field	60x100 m
Netball court	16x31m
Caretaker room	15
Storage room	25
Assembly area	-
Parking	Subject to needs

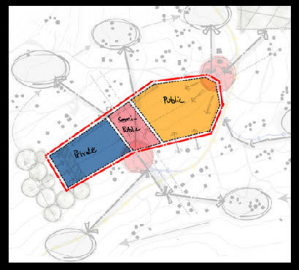
Community influenced spaces	Unit size m²
Community gathering space such as a hall with pluralistic functioning	250
Community sports field and other sporting infrastructure	80x100 m
Library and Information centre, Dual use for students and community	150
Agricultural Training and spaces for growing crops – food security	500
Workshops for skills training.	80x3
Cultural spaces	150
Water catchment and treatment facilities	--
Energy harvesting facilities, Solar power, hydro power, wind	--
Satellite clinic	120
Satellite post service	120

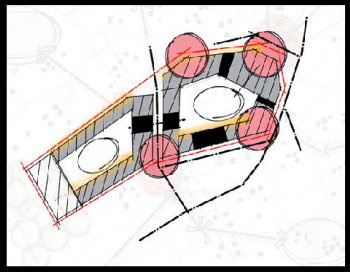


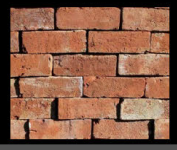






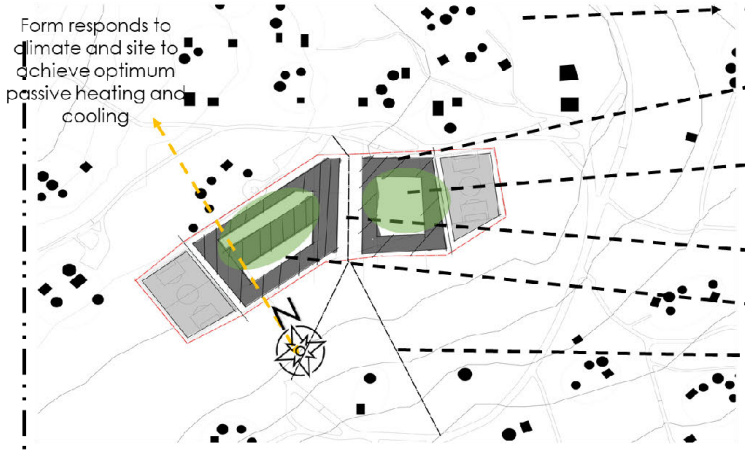




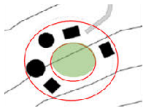


Form and spatial development

1 Form influenced from surrounding context



Form follows traditional architectural language



Form Response to edges

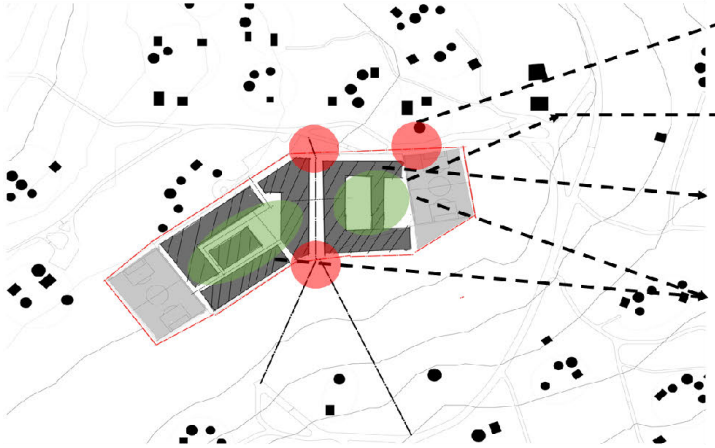
Defensible Space
Internal Courtyards
Unity through Form, sense of place

Natural pedestrian route

Courtyard space, **Inclusivity**

High Pedestrian **Linkage**

2 Form responds to context and community linkage



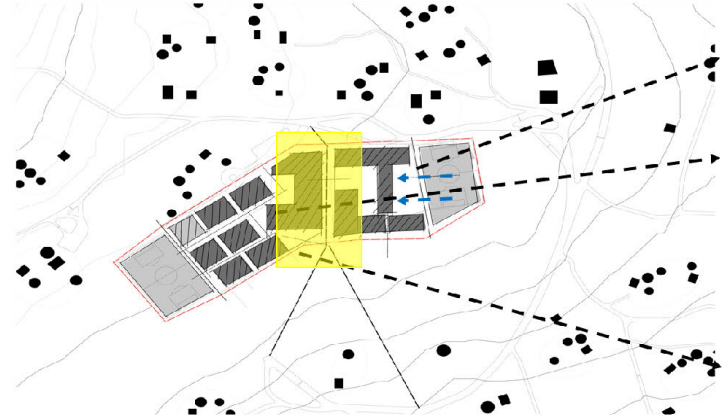
Nodes identified, edge activation

Form separated to provide Access on to site

Community facilities positioned on edges, **edge activation**

Breaking up of form to promote community linkage and views

3 Form responds to context and community linkage



Form set back to promote community interaction

Push and pull of form to create place making

Separation of classroom blocks to create interplay of inside outside learning

Grouping of shared community/school facilities

4 Exploration of form

Phenomenology
Experiential Architecture
- Integration
- Space/Light/Shadow
- Orientation
- Spaces through Built Form

Link between **school** and **community** space

Built form set back to **activate edge**

Community access and **rec space**

Form pulled out to create courtyard space, **Waldorf pedagogy**

Juxtaposition of classrooms to incorporate green spaces, **Biophilia**

Courtyard spaces

Place making and connections, activity nodes

Social active spaces

Linkages paths

Distinct & socially active spaces. Each zone has an interactive & identifiable social space that is easily accessible.

A sense of security, within each place that has been formed within the building wings .

Nodes at path intersections

During the intervals & between lessons the social places will become a hive of activity

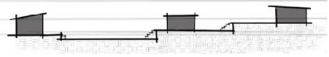
Nodes created by the intersection of 2 or more paths / walkways & the outdoor social places.

Internal paths and circulation

Nodes of intersections

Internal paths

Internal paths / routes / walkways are connected along the building edges. Along the paths the observers can engage with the indoor & outdoor space.



Use of levels to define hierarchy and give a sense of security.

Spatial arrangement

1 School parking

2 School admin

3 SNP Kitchen

4 Library, tech &Information centre,

5 Grade r Classroom

6 Grade 1-2 Classroom

7 Grade 3 Classroom

8 Grade 4-5 Classroom

9 Grade 6 Classroom/Adult learning

10 Grade 7 Classroom/Adult learning

11 Satellite postal & Clinic

12 Agricultural Training, water treatment facility

13 Community hall

14 Skills Development

15 Trade space

16 Community sports field

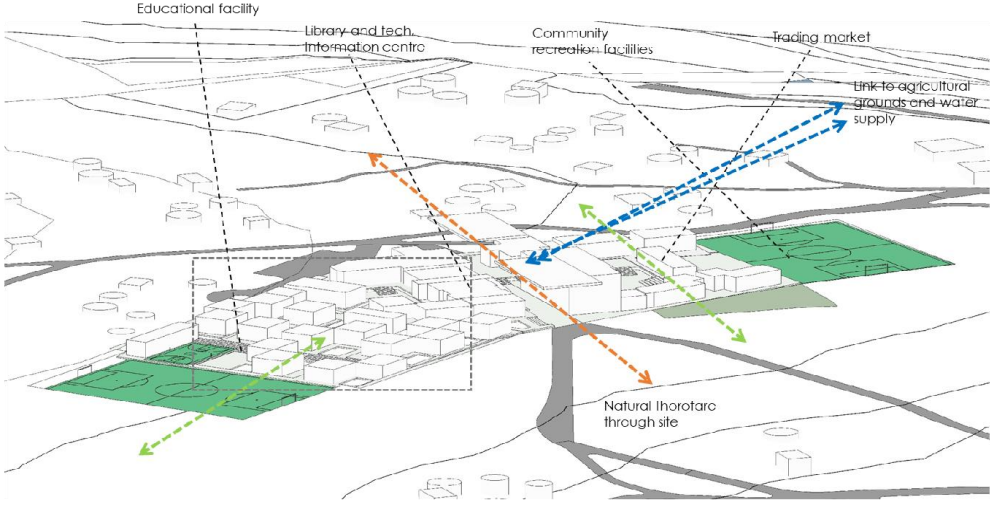
17 Access for ambulance

18 Community social/recreation facilities

Grouping of shared community/school facilities

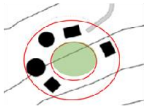
Adult learning situated on edge for easy access

Volumetric exploration

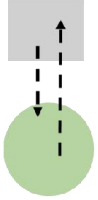


School planning

Form follows traditional architectural language



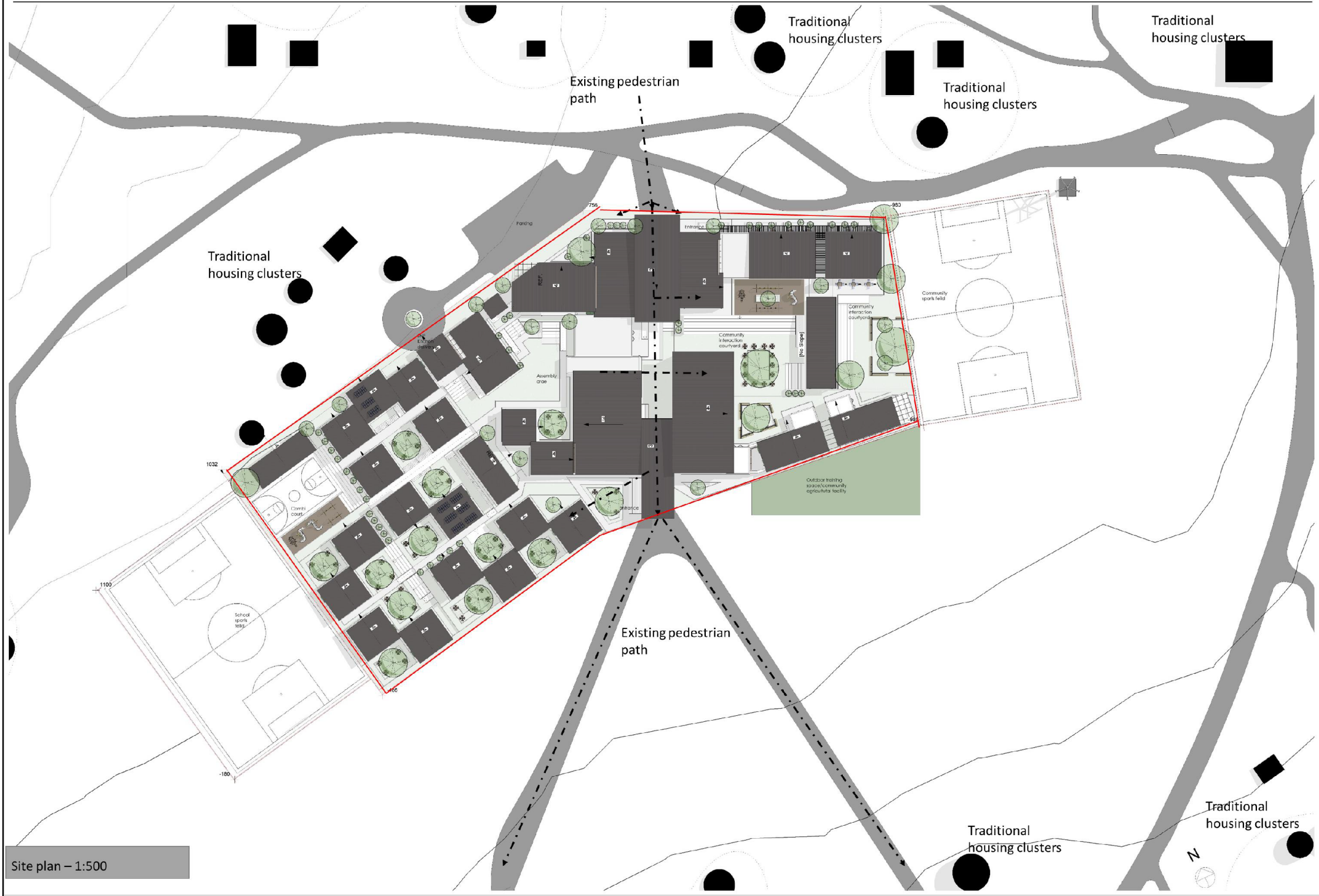
Juxtaposition of built form to create interlinking courtyards and promote experiential learning and create place making at a classroom scale



Classrooms

Outdoor learning spaces

Inside /outside Learning



Site plan – 1:500


Parking
Entrance
Offices
Water treatment
Store
Trade
Community sports field
Learner entrance
Admin
Tech/info centre
Community market, cultural expressions
Library
Community centre/Hall
Skill Development centre
Agricultural Training, water treatment facility
Outdoor training space/community agricultural facility
Assembly area
SC1
SC2
GR
GR 1
GR 2
GR 3
GR 4
GR 5
GR 6
GR 7
SNP
Storage room
Storage room/PE
Staff
Youth dev
Foreacourt
CY2
Adult learning
School sports field
Existing pedestrian path
N

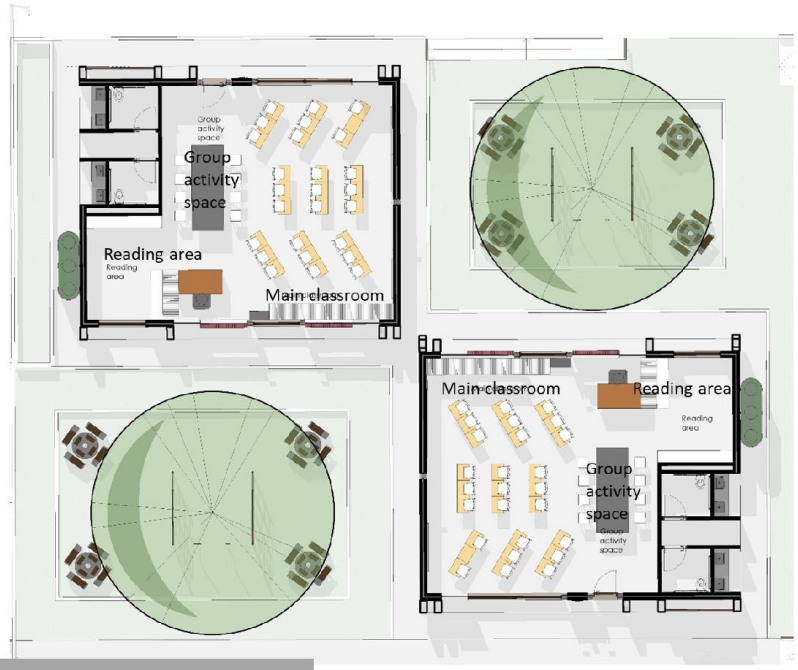
GFP– 1:300

GFP Community Precinct– 1:200

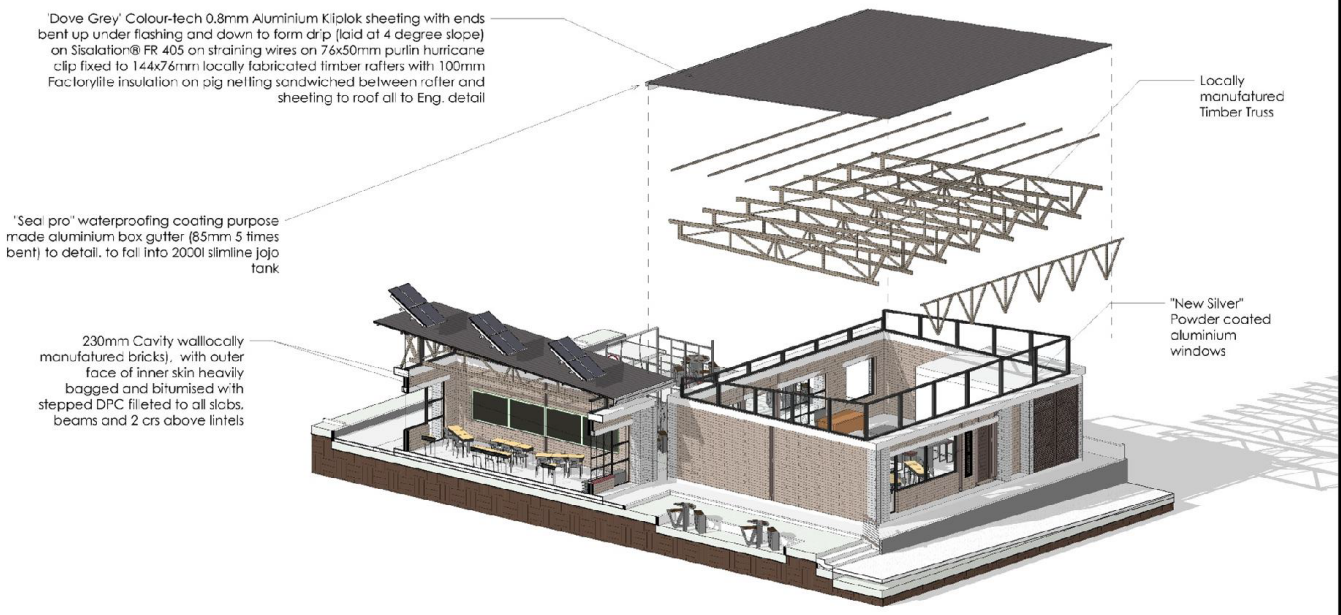
GFP Community Precinct– 1:200

GFP School Precinct– 1:200

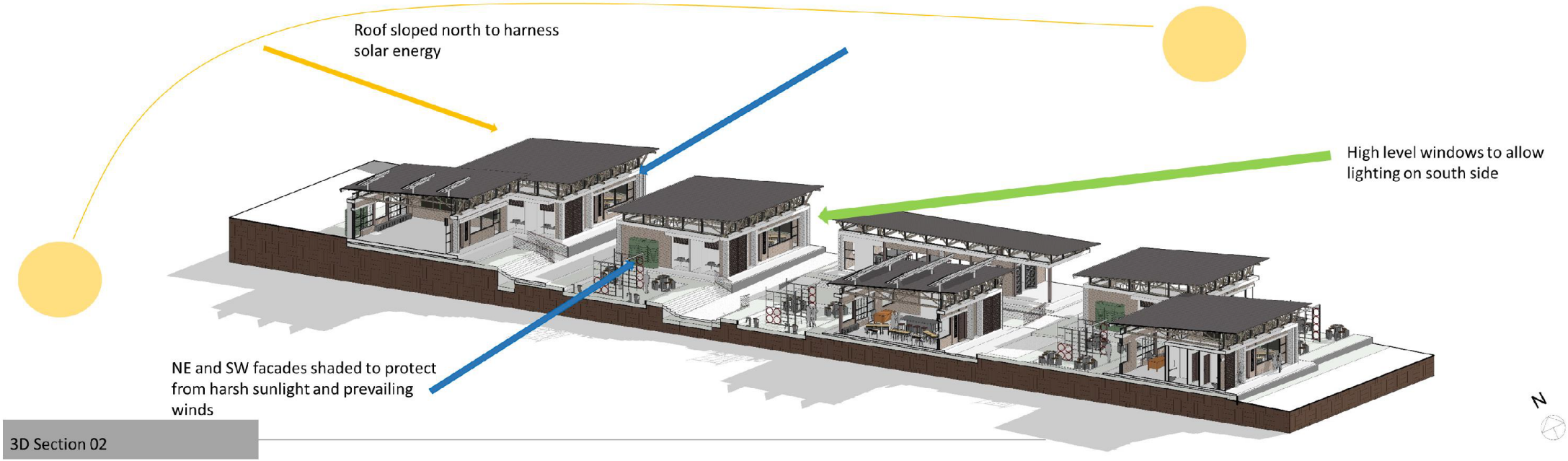
GFP School Precinct– 1:200



Typical Classroom plan - 1:100



3D Section 01

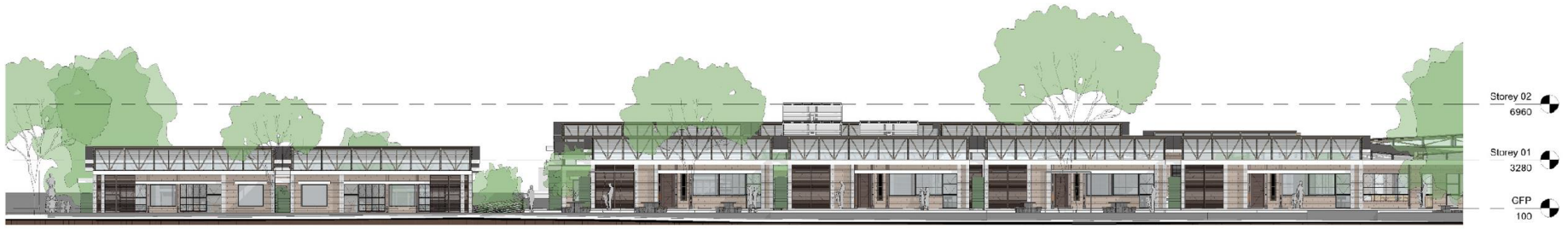


3D Section 02

Section A –A 1:100

Section B –B 1:100

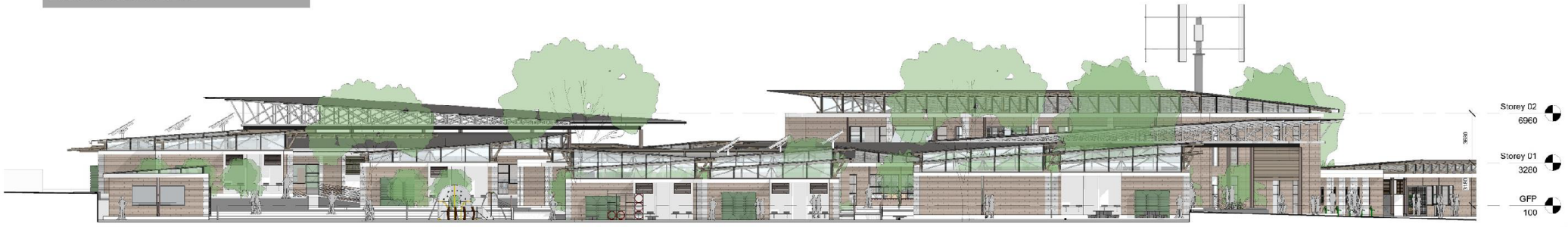
Section C – C 1:100



South Elevation 1:150

South Elevation 1:150

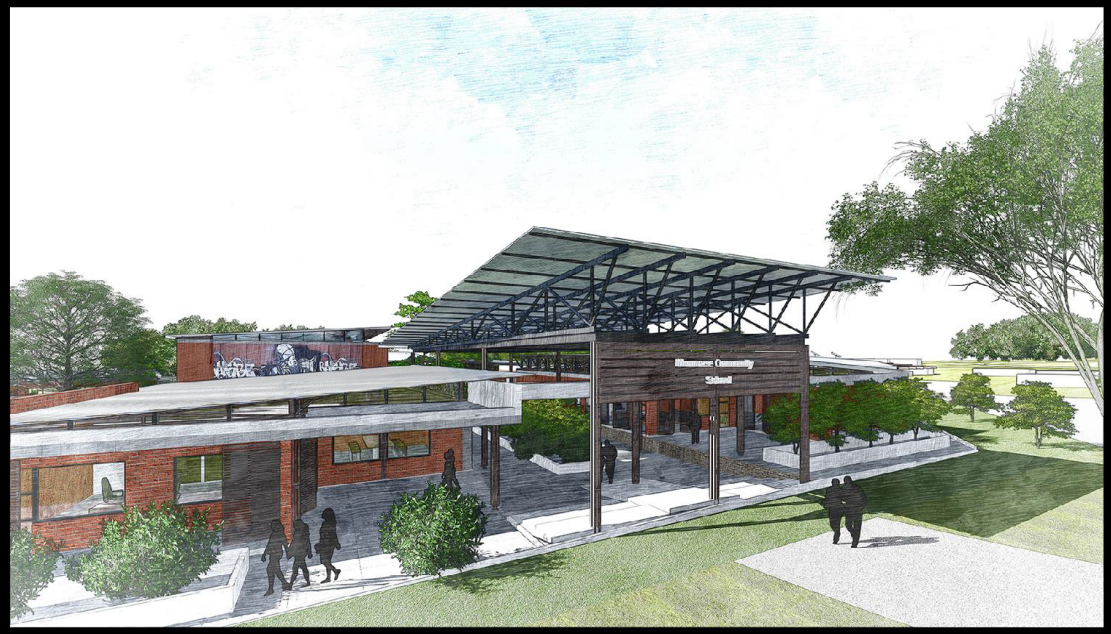
East Elevation 1:150



West Elevation 1:150

3D View of Community/School precinct

3D View of Community/School precinct



Entrance

3D View of Community interaction space

3D View of Community interaction space

3D View of Community interaction space, looking onto hall

Entrance

3D View of School assembly area

3D View of SNP Kitcken

3D View Outdoor learning spaces

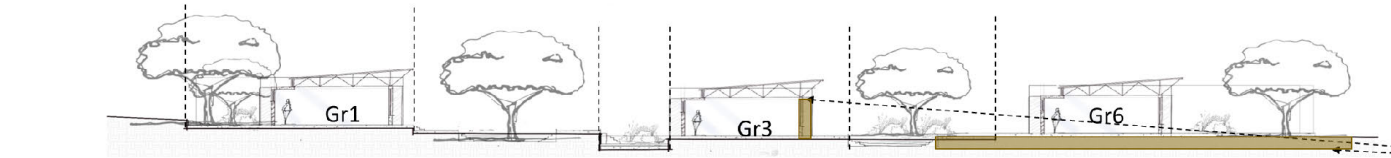
3D View Outdoor learning spaces

3D View Outdoor learning spaces

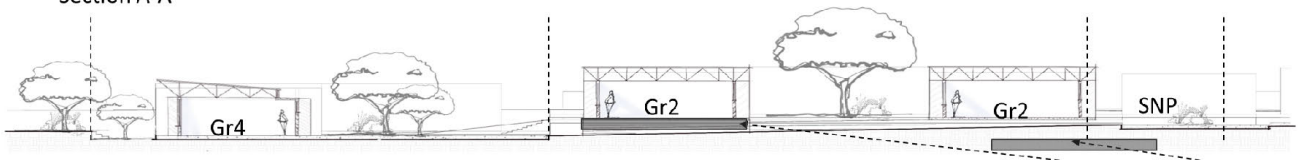
3D View of typical classroom interior

3D View Outdoor learning spaces

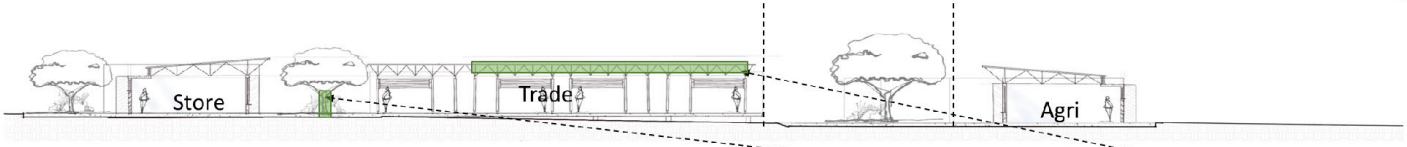
Technological Exploration



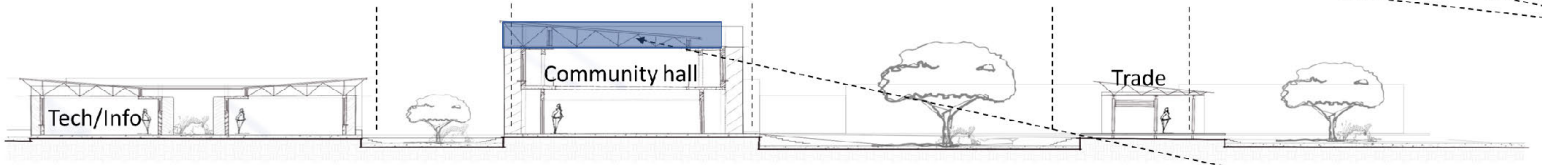
Section A-A



Section B-B



Section C-C



Section D-D

Materiality and justification

A rural school is constrained in budget, which is why the inexpensive, durable and easily maintained materials have been chosen., that also draw on the principles of sustainability.

Natural clay

- In order to maximize efficiency with scarce capital, a clay, stone and mud hybrid construction was mainly used.
- Clay is widely available in the region and is often used in construction. This will also promote job creation
- The traditional clay-building methods have been revised and modernized in order to construct a more structurally sound structure.
- The additional advantage of clay bricks is that they are cost-effective, simple to make and thermal protection against the heat climate.

Stone

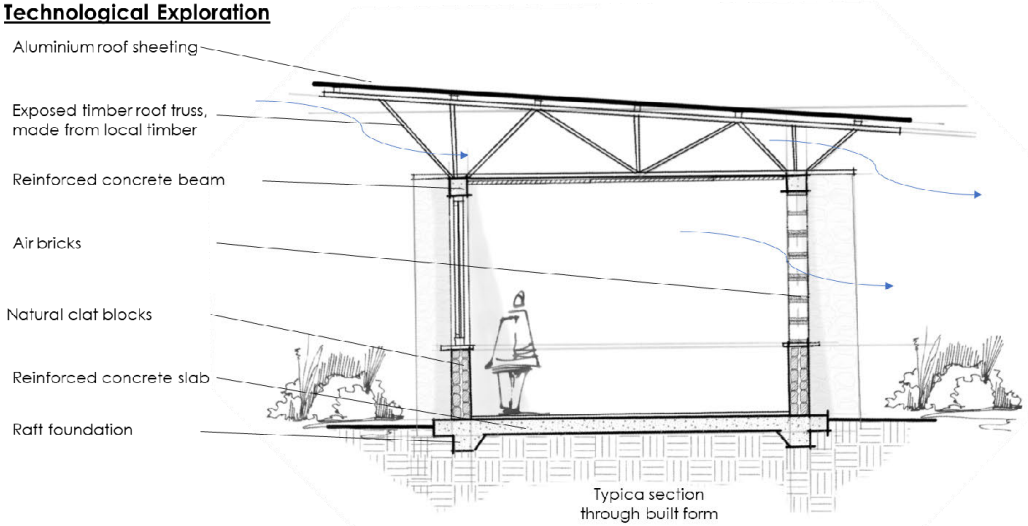
Local timber

- Timer is readily available in the region, and is often used by the locals in constructing their homes.
- The use of local materials shows a sense of integrity and community and provides a connection on a more phycological level.

Steel

- The use of steel , will provide an update aesthetic to the rural context .
- Efficient to use
- Hardwearing
- Reliable

Technological Exploration



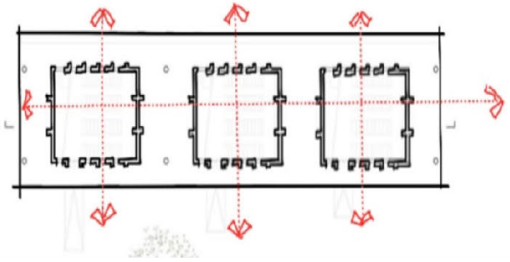
Typica section through built form

Earth building under construction , Source: https://www.eastcoastarchitects.co.za

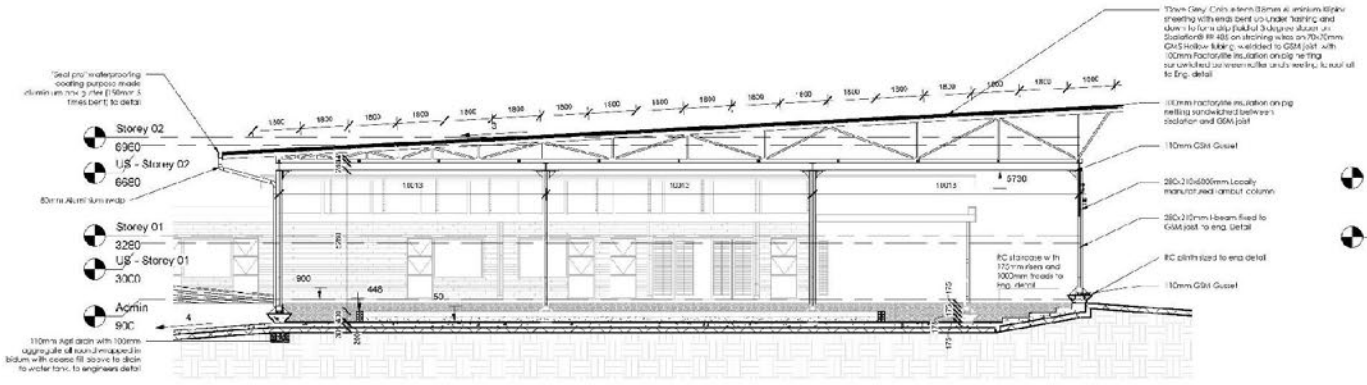
Domus rural school, Source :https://i.pinimg.com/orginals/c3/81/04/

Materials are to be sourced locally. The construction will draw on the local methods and knowledge, with the community members being heavily involved in the construction process, thus creation jobs and boosting the socio economic status of the community.

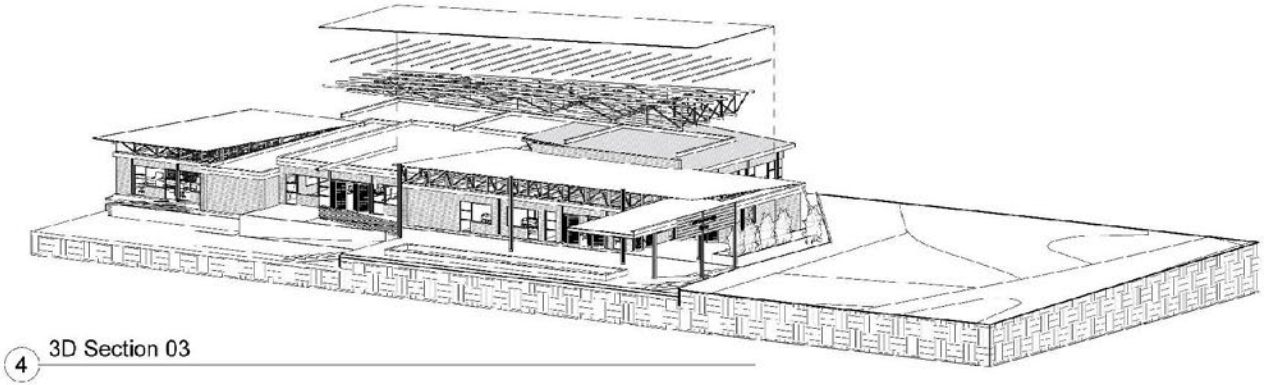
The construction and materials also draw on the sustainable design principles such as passive cooling and solar heat gain.



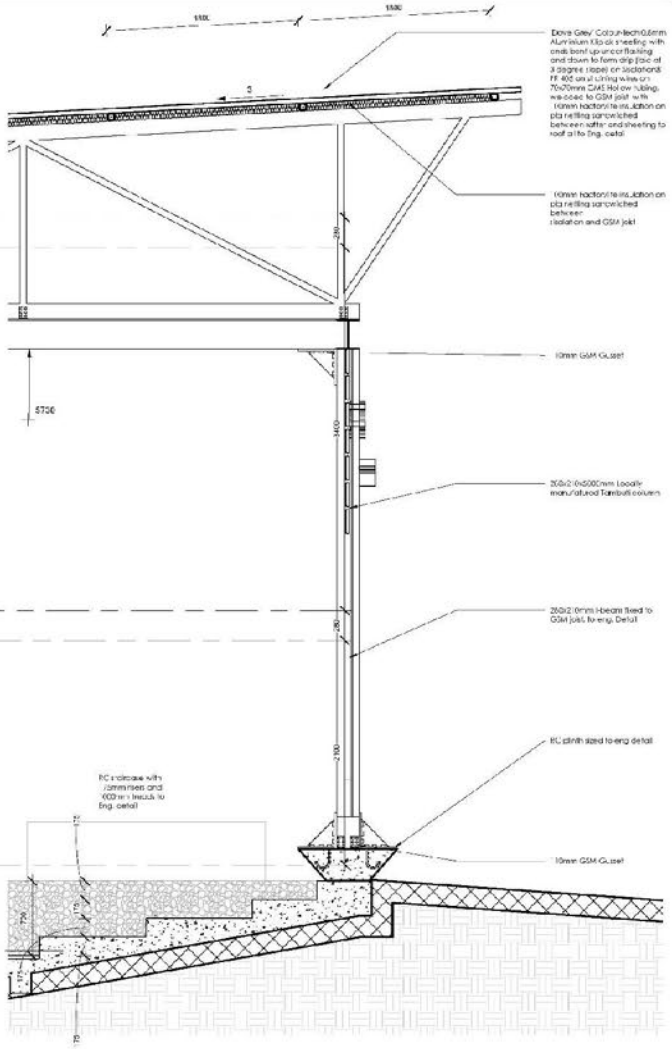
The building is built on a modular basis with the repetitive structure. This type of construction method would be efficient for the community to construct and would require little heavy and expensive construction equipment.



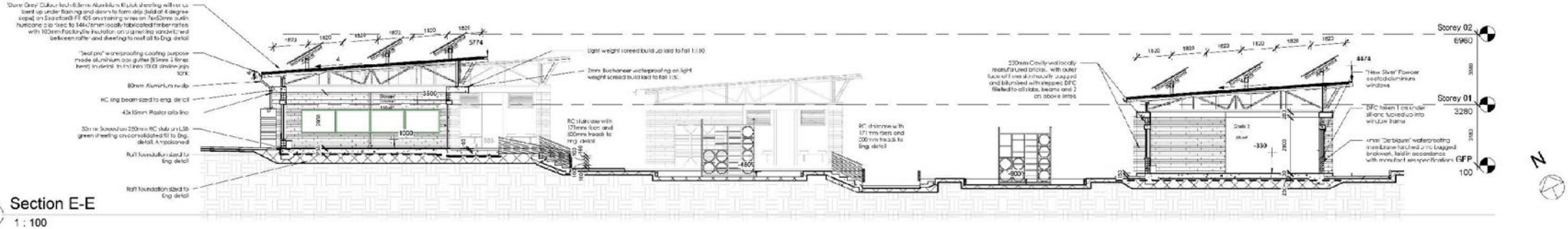
1 Section D-D
1 : 100



4 3D Section 03



3 Strip detail A-A
1 : 25



2 Section E-E
1 : 100