

## Article

# Developing Adaptive Curriculum for Slum Upgrade Projects: The Fourth Year Undergraduate Program Experience

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**Abstract:** Slum formation is a visible outcome of population growth, rapid urbanization, economic and political policy. Currently, there are approximately one billion slum dwellers, representing approximately thirty percent of the global population. As evident, slums as a critical issue will remain in the upcoming decades. The discipline of architecture should consider the issue of a slum in its curriculum, especially within the design studios. This research attempts to integrate the slum topic within the fourth year undergraduate architecture curriculum and develop a pedagogical framework concerning architectural design projects that focuses on slum topic. The Graduation Research & Preparation (ARC 403) course and Graduation Project (ARC 402) course are modified in order to be responsive to the slum topic. The novelty of the framework can be categorized as follows: the proposed framework is context specific. It is based on an interdisciplinary approach to architecture and ethnography. It utilizes ethnographic tools for collecting data during fieldwork. It values research throughout the design process. A research-based approach prepares young architects for future complex challenges. It requires the young architects to utilize research and build an inventory of collected data, which can guide them during the design process as a reference point. It attempts to increase the awareness of the young architect regarding the discourse on social sustainability. It values social equity, quality of life, and well-being as core indicators of social sustainability and tries to integrate the indicators within the curriculum. The aforementioned indicators can guide young architects to reach strategic decisions to achieve sustainable design solutions.

**Keywords:** architecture curriculum; pedagogy; architecture pedagogy; slum upgrading; architecture design framework



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## 1. Introduction

The global population continues to grow. The global population reached 8 billion in November 2022. Currently, the global population is three times that of 1950. According to projections, it is estimated that the global population will reach approximately 8.1 billion in 2025, almost reach 8.6 billion in 2030, and 10.1 billion in 2050 [1–3]. It is expected that much of the demographic change up to 2050 will occur in less developed countries [4]. As predictions suggest, future population growth is inevitable (Figure 1).

Since 2009, approximately 3.42 billion people have been dwelling in cities, while around 3.41 billion are rural dwellers. It is evident that the number of city dwellers has exceeded the number of rural dwellers. Since 2009, more than half of the earth's occupants have dwelled in major cities (Figure 2). In 1950, approximately 30 percent of the earth's occupants lived in major cities. According to the projections, by 2050, nearly 66 percent of the earth's occupants will be city dwellers. By 2050, Asia is expected to become 64 percent urbanized. Between 2014 and 2050, the world's urban population is estimated to increase by 2.5 billion city dwellers [5,6]. Currently, there are 21 megacities globally, each with a

minimum of 10 million dwellers, which house 9.4 percent of the world’s urban population. According to projections, by 2025, about 10.3 percent of the globe’s urban population will dwell in megacities [6]. As it is evident, urbanization is inevitable (Figure 3).

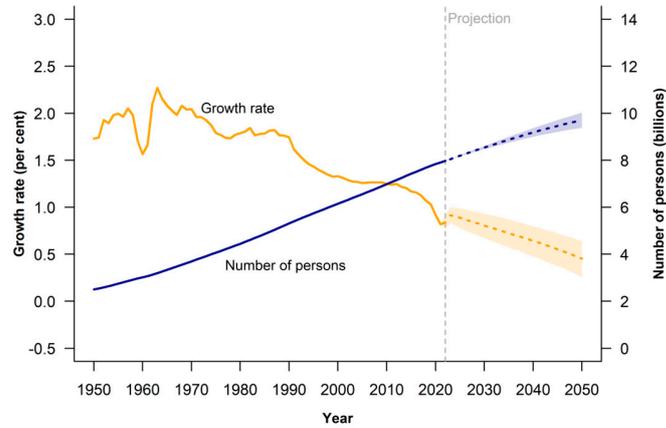


Figure 1. Global population size and annual growth year between 1950 to 2022 [1].

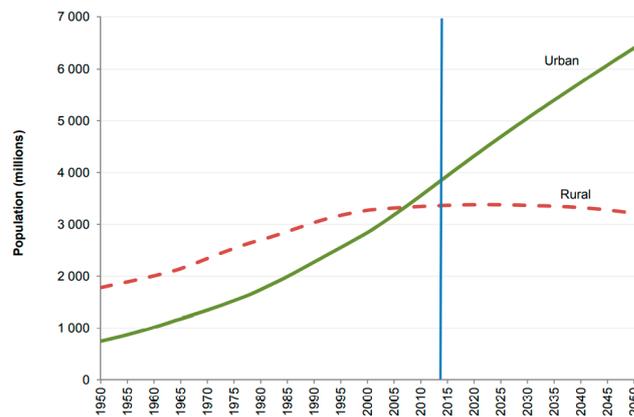


Figure 2. The globe’s urban and rural populations between 1950 to 2050 [5].

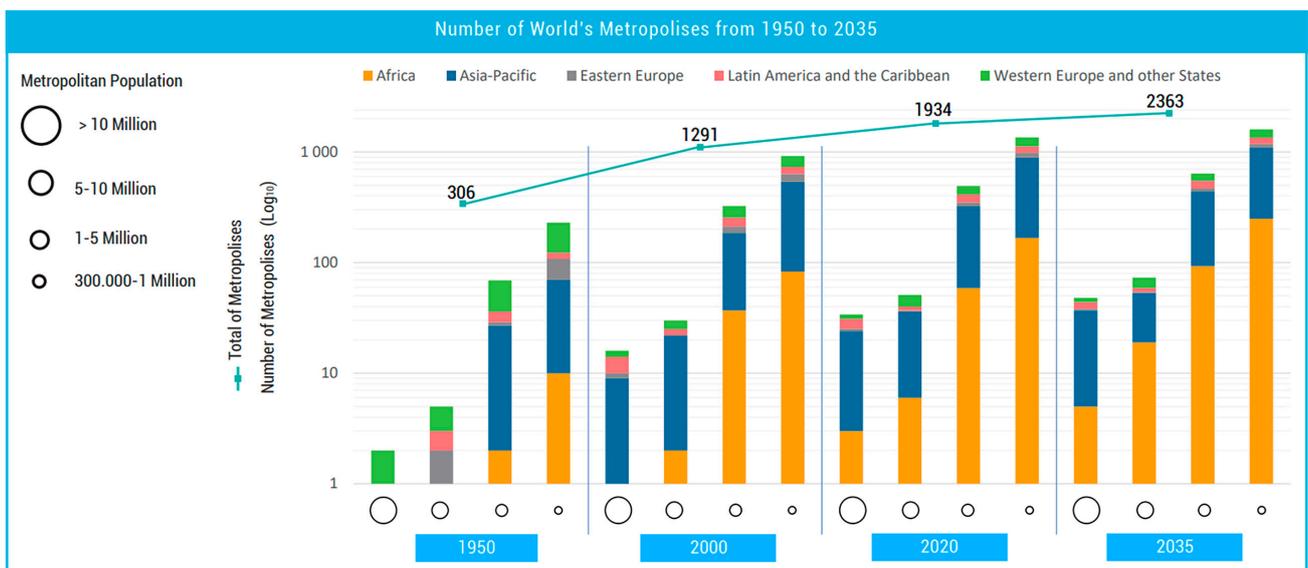


Figure 3. Number of world’s metropolises from 1950 to 2035 [7].

Slum formation is a visible outcome of rapid urbanization, economic and political policy. Asia is urbanizing fast and meanwhile houses the largest proportion of the population residing in slums globally. In 2001, Asia hosted approximately 554 million slum dwellers, around 60 percent of the globe's entire slum population. Population growth also contributed to the growing number of slum dwellers. Due to the rapid urban population growth, city governments and authorities cannot provide adequate, affordable houses for the low-income segments of the urban population [8]. The majority of low-income urban dwellers are obliged to reside in sub-standard houses in impoverished slums, which are usually located at the urban fringes [8,9]. Widespread slums located on the periphery of major urban centers manifest in city governments' incapability to accommodate a growing population [10].

Slum areas are the result of informal economy, which contains informal jobs and an informal market [11,12]. Such informal economy includes semi-formal, quasi-formal and informal economies, which are grounded in the formal economy [11–13]. Formal financial measures in line with formal political and economic systems so far failed to generate prospects to establish informal businesses, jobs, services or productions within the slum areas. In this regard, informal small businesses offer products and services to both formal and informal sectors of the society [11,14]. In this regard economic and political substances, procedures and measures shape both informal and formal areas within urban environments [11,15].

Neoliberal and postmodern approaches also affects the slum areas. According to postmodern development approaches, the main concern of development in some urban centers is focused on the rich and developed urban areas. In such societies, development is segmented and individualized, which is grounded on private investment, bank loans and a financial system that operates under a neoliberal government with a postmodern approach [11,16]. Marginalized groups such as slum dwellers usually do not have access to bank loans and the formal financial system; therefore, they have to find innovative ways to encounter their financial deficiencies. In this regard, formal economy and political decisions create an uncertain condition that forms the slum settlements.

Post-colonial capitalism with its global social dynamics generate inequalities, which shape the contemporary cities of the global south. Neoliberal alteration has caused enormous social change in the previously mentioned urban centers. It rearranged the equilibrium of social power. It reinforced some classes, such as the capitalist class, with contacts to international economy, and rigorously weakened the power and position of the middle class and low-income class. Policies such as privatization, trade liberalization, decrease in public spending, decrease in social services spending, user fees introduction and reorganization of economic enterprise have contributed to the growth of the informal sector in major cities and rural areas. In this regard, slum formation and the deteriorating condition of the slums in major cities are the products of neoliberal policies [17].

Currently, there are approximately one billion slum dwellers globally, representing approximately 30 percent of the global population [9,18–20]. Since 1990, the number of people who reside in slums has been increasing. In most developing countries, slums are a dominant and growing feature of the urban landscape. Globally, Eastern and Southern Asia, Sub-Saharan Africa, and Latin America host the largest number of slum dwellers [9,18].

Terms such as slums, informal settlements, shanty towns, favelas, and squatters have been used to describe unplanned urban areas. This research utilizes the term slum and follows the UN-Habitat definition of the slum, widely used globally. The slum is defined as an area that contains one or more of the following characteristics: (1) Poor housing quality; (2) Lack of sufficient living area; (3) Shortage of safe water; (4) Shortage of sanitation and other infrastructure; and (5) Lack of secure tenure [9,20]. Usually, slum dwellers suffer from malnutrition and hunger, exhibit higher disease rates, attain less education, and have few employment opportunities than city dwellers living outside the slums. The rate of HIV/AIDS is usually higher among slum dwellers than their rural counterparts [21].

The slum remains a critical issue. In this regard, the discipline of architecture is obliged to consider the issue of the slum in its curriculum, especially within the design studios. Architecture curricula should be sensitive to the actual-world social and environmental issues. Architecture school graduates should be adequately equipped to meet contemporary and future challenges [22,23]. A socially and environmentally responsive curriculum allows the profession to remain relevant to society [23].

#### *Fourth Year Undergraduate Architecture Curriculum*

The primary intention of this research is to present the proposed pedagogical framework concerning slum upgrading design projects within the fourth year architecture curriculum in the Department of Architecture at the Faculty of Architecture, Design & Fine Arts. The proposed pedagogical framework has been grounded within the updated fourth year undergraduate architecture curriculum. Both updated and former fourth year curriculum consist of two following core courses: Graduation Research & Preparation (ARC 403) course and the Graduation Project (ARC 402) course. The current curriculum was updated and modified in Fall 2011. The primary intention was to redefine the goals and objectives of the aforementioned courses within the fourth year curriculum and to define, modify and run a pedagogical framework concerning slum upgrading design projects.

Within the former curriculum, the aforementioned courses were grounded on the following pedagogical theories: (1) It was grounded and influenced by the traditional Beaux-Arts school of thought and followed a master–apprentice teaching and learning model, which highly values a formalistic, conceptual or functionalist approach to architecture design with partial concerns for contemporary social, cultural, economic and sustainable issues; (2) The fourth year curriculum was not grounded on social sustainability discourse. The main indicators of social sustainability, such as social equity, well-being and quality of life, were not integrated within it; (3) The fourth year curriculum lacked specific pedagogical frameworks that focus on specific topics such as slum upgrading.

Since Fall semester 2011, the academic staff within the aforementioned unit decided to update the fourth year architecture curriculum. The academic staff recognized the necessity of defining a systematic approach for architectural proposals and design projects, which focuses on specific topics such as slum upgrading. This research presents the proposed pedagogical framework that has been defined, modified and ran since Fall semester 2011 within the aforementioned unit.

The updated fourth year architecture curriculum is grounded on the subsequent objectives: (1) It focuses on delivering a pedagogical framework that is specifically developed for architectural graduation projects focusing on the topic of slum upgrading; (2) It encourages the young architects (the term “the young architects” denotes fourth year undergraduate students) to focus on the context-based design process by considering the local context, local people, and their everyday demands. Young architects are advised to meditate on the possible consequences of their design proposals on the local context during the design and decision-making process [23]. Rather than focusing on imaginary scenarios in imaginary settings, the Graduation Research & Preparation (ARC 403) course and Graduation Project (ARC 402) course attempts not to barricade itself from the principal issues that form the landscape of society and not to distance itself from contemporary social and environmental issues [24,25]. There was an attempt to reconsider the traditional teaching methods and processes, which contain delivering information, demonstrating the technique, and providing practice opportunities, to better prepare young architects to be responsive enough for future complex environmental, economic, and social issues [26,27]; (3) Within the updated curriculum, the fourth year design projects are required to be socially and culturally responsive, which means that the young architects, during their design process, are encouraged to collaborate with local people as the end-users and reflect their voices in their design projects. In this way, the design solution can be developed in conjunction with societal demands [25,28,29]. In this vision, local communities, such as slums, are empowered by being engaged during the data collection and design process; (4) The discourse on social

sustainability with its main indicators, such as social equity, well-being and quality of life, are integrated within the updated curriculum in order to familiarize the young architects with the aforementioned discourse and its indicators.

During the last decade, the subject of slums has been raised, studied, and experienced by young architects and lecturers within the fourth year curriculum. The specific framework presented in this article is the outcome of theory and practice conducted within the updated fourth year curriculum. A complex topic, such as slum upgrading, is suitable to be raised within the fourth year architecture curriculum since the fourth year young architects are adequately equipped to undertake and experience complex topics, such as slum upgrading, which deals with current complex social, economic and environmental issues.

Globally, the discourse on sustainability is a key phenomenon in architecture; it is a mainstream concern in design studios [22,30,31]. There has been a broad consensus on the need to integrate sustainability into the architecture curriculum. Both academic staff and young architects are highly motivated to prioritize sustainability within design studios/design projects and enhance their knowledge of sustainability [22,32,33]. Graduated young architects must be equipped with expertise, knowledge, multidisciplinary skills, and competence to deal with complex real-world social, economic, and environmental issues. This necessitates that the universities restructure the existing curriculums to be more responsive to the sustainability discourse by exploring and implementing new pedagogical ideas [32,33].

Several architectural schools are questioning which sphere of sustainability should be highlighted and which teaching methods should be utilized to teach sustainable architecture more effectively [34,35]. So far, the social sphere of sustainability has received little attention in architecture education; on the contrary, the environmental sphere has acquired more attention. In this regard, sustainable architecture is identical to designing energy-efficient or environmentally responsive buildings, utilizing engineering-based applications. Besides the environmental aspect of sustainability, the social and economic aspects also should be incorporated within architecture education since sustainable architecture encompasses social, economic, and environmental aspects. In this regard, architecture education is responsible for empowering young architects to safeguard the well-being, welfare, security, and cultural interests of society in line with the sustainability of the built environment. To achieve a well-designed built environment, which is the foundation for a healthy society, social sustainability should be emphasized more in architecture curricula and education [35]. The updated fourth year curriculum is in conjunction with the social aspect of sustainability. To effectively integrate social sustainability in the design studio, the principles of social equity, well-being and quality of life should be embraced within a socially, environmentally, and economically viable design process.

This research is based on the following research questions:

- (1) In which way can the fourth year curriculum be modified in order to be responsive to the slum upgrading topic?
- (2) In which way can the fourth year curriculum be updated in order to be responsive to the principal social sustainability indicators such as social equity, well-being and quality of life?

The principal objective of this research is as follows: to present the proposed pedagogical framework, which has been developed for the updated fourth year architecture curriculum. The following points are implemented within the framework: (1) It specifically focuses on the slum upgrading topic; (2) It is context-based; (3) It is socially and culturally responsive; (4) The principal indicators of social sustainability, such as social equity, well-being and quality of life, are integrated within the framework.

## 2. Theoretical Framework: Architecture Education

Beaux-Arts, Bauhaus and Polytechnique are three main school of thought, which have influenced architecture curricula globally. The Beaux-Arts was established in France in the 19th century [36,37]. In the discipline of arts, the origins of the modern education

system is a project rooted in Ecole des Beaux-Arts. The aforementioned school considered architecture as one of the branches of fine arts with an emphasis on the aesthetic aspects of architecture rather than the practical side [38]. Students were assigned to ateliers, which were monitored by a distinguished architect who acted as the student's guide and critic [39]. The master of the atelier worked with students on make-believe design projects [38]. The aforementioned school regarded design as the core of the program [39]. Bauhaus was founded in Germany in the early decades of the 20th century by Walter Gropius [36,37]. The Bauhaus educational approach was mainly based on practical experiments while being mindful of social demands. It was mainly anti-academic and mistrustful of theory. Bauhaus regarded craft as the essential component of the program [39]. Bauhaus attempted to integrate different art disciplines within the workshops. Various masters, students and disciplines were united into its schedule [40]. Each workshop in Bauhaus had its master and the workshop's content and applied pedagogy were defined by the master. The master/student relationship was founded on mutual explorations [39].

The Beaux-Arts and Polytechnique school of thought mainly focused on a master–apprentice instruction model. The aforementioned model was integrated within architecture design studios as the core subject of the curriculum. Globally, current architecture pedagogy is still mainly under the influence of the aforementioned school of thought [29,36,37,40].

The current architecture pedagogy under the influence of the master–apprentice model mainly highlights a formalistic approach to design with partial concerns for current social, economic and environmental issues [37]. The master–apprentice model, which was developed by the Beaux-Arts and Polytechnique, regarded architecture as an art that is detached from the social, cultural, ethical and political context [37,41]. Since 1960, both architecture educators and professionals have been criticizing the aforementioned pedagogy. It is highly recommended that the current architecture curriculum needs to be updated in order to better prepare the young architects for the contemporary and future social, economic and environmental challenges. Issues such as rapid urbanization, social changes, climate change and sustainability and its goals need to be implemented within the architecture curriculum [36,37,42–45]. Alternative pedagogies suggest that conventional architecture pedagogy should be context-based. It should encourage the young architects to engage in fieldworks and study the context. It should encourage them to engage with the local community and reflect the community's voice within their design proposals and projects.

### *2.1. Slum Topic in Architecture Education*

Slums, where the majority of urban dwellers reside—especially in developing countries—offer a particularly vital ground for academic investigation. The discipline of architecture, particularly architecture design studios, regards slums as laboratories for architecture education. The topic of the slum can deliver valuable learning perspectives and insights for young architects and studio lecturers within both undergraduate and graduate programs. The topic of the slum should be covered and highlighted as a research and design topic for the architecture studio and architecture pedagogy since, according to the statistics, nearly one billion individuals reside in slums globally [9,18–20,46]. Asia alone hosts approximately 554 million slum dwellers [8]. Young architects within the architecture programs should be granted the opportunity to visit, conduct fieldwork, study and analyze the complex landscapes of slums and deliver architectural design proposals and projects [46].

Globally, various architecture schools are adopting new methods of design philosophy in their programs in order to equip young architects with the tools to deal with complex contemporary social, economic and environmental issues. Participatory design as a design approach is capable of enhancing the young architect's perception of the context and the end-user's needs. Participatory design can be regarded as a dynamic process that is based on the following crucial factors: it raises the young architect's awareness of “cultural

design”, which refers to a particular design process that is based on the end-user’s culture. Participatory design assists the young architects to gain an in-depth insight regarding context. The users are also involved during the design process, and their preferences and needs are reflected within the design projects [47–51].

Both Graduation Research & Preparation (ARC 403) course and Graduation Project (ARC 402) course are based on the following theories and methodological tools: (1) The young architects are familiarized with the fundamentals of conducting fieldwork and utilizing ethnographic tools of data collection such as: (1) Participant observation; (2) Informal interviewing; (3) Walking and observing the site; (4) Mapping techniques; (5) Sketching on-site; and (6) Visual documentation. The aforementioned methods assist the young architects to understand the context; (2) The young architects are encouraged to engage with the community in order for their insights to be reflected in their design proposals and projects. In this way, their design projects will be more socially and culturally responsive. It is based on a bottom-up approach rather than a top-down approach, which usually values individuality and autonomy. Engaging with the community assists the young architects to be more familiar with the context and not to impose their own ideologies or preconceived notions in their design proposals and projects.

## 2.2. Social Sustainability: An Overview

The term sustainability has gained status and widespread popularity since 1980. As an extremely popular term and a buzzword, it can be found across various disciplines and topics [52,53]. It can be considered an open concept with myriad interpretations and context-specific understandings [54]. The growing debate over global environmental issues contributed to the formation of the sustainability paradigm. In fact, the 21st century can be regarded as the century of sustainable development. It is expected that the sustainability paradigm will remain a pervasive paradigm for a long time [55–57]. Sustainability is fundamentally about the preservation of natural capital. A system can be sustainable if it is capable of surviving and enduring on a long-term basis. It takes into account the responsibility of the current generation, as well as the future generation. It is the ability to think and plan [52].

The concept of sustainability and development or progress can be seen throughout history in the Classical Greco-Roman period, Hebrew and Christian theology, Medieval period, Renaissance, Enlightenment, the Industrial Revolution, and 19th and 20th century [58]. Within the 20th century, the concept of sustainable development emerged during the late 1960s and early 1970s. People had become aware that rapid scientific and technological progress in line with industrial and commercial expansion was causing damage to the natural environment [54,58,59]. Publications such as *The Silent Spring* [60], and *A Blueprint for Survival* [61] raised general awareness regarding the ecological damage caused by human activities [54,58]. The concept of indefinite development and growth was also challenged during the 1970s and lost much of the appeal it had in the previous generations. It was argued that modern economic growth based on indefinite growth and development is unsustainable for a finite planet [54]. As a result, a discourse emerged that argued that the capitalist economic growth of the Western world was basically incompatible with sustaining and preserving the ecology, and called for paradigm change [54,62,63]. Such realizations paved the way for sustainable development as a new mode of thinking [58].

World Commission on Environment and Development (WCED) issued the report titled “Our Common Future,” which was recognized as the Brundtland Report in 1987. The aforementioned report offers the following classic definition of sustainable development: “Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [64] (p. 43). One of the most cited definitions of sustainable development is the above-mentioned one [65]. The discourse on sustainable development became widely popular after the publication of the *Brundtland Report* [54]. Since the 1980s, there has been academic and policy debate about sustainability, especially in various conferences held by the United Nations [53,58].

As a result, the term sustainability attained much wider currency. It became the dominant paradigm of the environmental movement [54]. Since the publication of the *Brundtland Report*, sustainable development discourse has been utilized as a guideline to pursue environmental reform by both public and private organizations [66].

In the triad of sustainable development, sustainability is the intersection of the three main spheres of ecology, society and economy, sometimes referred to as the “three Es”. The three spheres constitute a series of interrelated concepts, which should be the bedrock of any decision and action. The classic triad of sustainable development is grounded on the balance between the three spheres [54,57,67–71]. Generally, the relationship among the three spheres is mutually supportive and compatible [66]. Ecology is focused on preserving and restoring natural habitat, environment protection, and resource management. The social goal is to achieve the following factors: equity, the satisfaction of basic human needs, human rights, social inclusion, enhancing the individual’s well-being and quality of life in a particular society, preserving cultural identity and respecting cultural diversity. The economic sphere is essential in maintaining capital, which is required for generating income. In the economic sphere, smart growth, long-range planning, cost saving and spending are vital. They focus on a type of economic activity capable of enhancing human development while being environmentally and socially sustainable [54,72]. Sustainable development can only be achieved when there is a balance between the three dimensions. Achieving balance is a challenge because, during the process, each sphere of sustainability must respect the interest of the other sphere, not to bring it out of balance. During this process, a certain sphere might become sustainable while others are unsustainable [57,67].

The classic triad of sustainable development received criticism and challenges from the beginning. The critiques given can be categorized as reformist and revisionist. The reformist critique accepts the tripartite model of sustainability, namely the three Es. However, it calls for an efficient balance and coordination among the three spheres to gain better sustainability. On the other hand, the revisionist approach challenges the tripartite model’s precision and all-inclusiveness and suggests either a totally new framework or a multi-pillar model [73,74]. Reformist and revisionist approaches recognize the social sphere of sustainability as a crucial sphere of sustainable development.

After the Brundtland Report’s publication, social sustainability gained formal and international reputation [75]. Among the three pillars, the social sphere of sustainability is the least conceptually defined pillar [66,73,75,76]. The social dimension is either dismissed entirely or receives less attention than the economic and environmental aspects of sustainability [66,68,69,77]. It is under-theorized. It is a concept in chaos and has not been well developed. It is an open and contested concept [66,73,74,76,78]. It can be regarded as a dynamic concept that changes over time [66,79]. Social sustainability focuses on the ability of human beings of every generation not only to survive but to thrive. It plays a crucial role in the steady journey toward sustainability. Ultimately, human beings (individuals and collective) determine environmental and economic well-being [75]. There is several key concepts that are assembled under the social sustainability umbrella, including satisfaction of basic needs, intergenerational justice along gender, race, and class, equality of rights, access to social infrastructure, occupation, education, health, safety, cultural diversity, social cohesion, sense of community, social recognition, well-being and quality of life [66]. Among the mentioned factors, social equity, quality of life, and well-being are key issues discussed in weekly theoretical lectures in the architecture design studio; therefore, further elaborations are needed.

Equity is a key factor in the sustainable development discourse. Social and economic inequality is a major issue in many countries across the globe. There is a positive association between a lower social and economic status and higher mortality in current populations [80–82]. Social and economic inequalities may promote conflict between and within ethnic groups, classes, and societies [80,83,84]. It seems that they elevate the prevalence of poor health, psychological illness, crime, and other societal ills. Inequality may disempower local minority communities and, as a result, reduces cultural diversity. Inequal-

ity is the foundation of unsustainable behaviors. It promotes overconsumption by making it socially acceptable for certain sectors of society to have far more than the rest. In this regard, by associating consumption with social status, overconsumption is justified [80,85].

In the social sustainability discourse, social equity as a key concept advocates for the following criteria: (1) It focuses on satisfying basic human rights. Citizens in every society should be able to participate in civic and social life; (2) It advocates for equal and fair access to basic services, welfare goods, and life chances for all members of society regardless of race, gender, and social status. All members of society should have fair and equal opportunities to survive and fulfill their development potential; (3) It provides basic physiological needs such as nutrition, water, shelter, and sanitation especially considering the least advantaged groups in a society. The aforementioned basic needs are the bare requirements for the minimum acceptable level of well-being, and should be regarded as basic human rights [69,75,86]. Social equity emphasizes equal and fair access to clean water, food, appropriate and affordable housing, employment opportunities, education, community services, and health services for all segments of society. In this regard, all members of society should have the opportunity to live a safe, healthy, and fulfilling life [68,69,73–75].

Quality of life is a complex and multidimensional concept. Due to the subjective nature of quality of life, there is no universally agreed definition. The World Health Organization (WHO) provides the following definition: “individuals’ perceptions of their position in life in the context of the culture and value systems in which they live and about their goals, expectations, standards, and concerns” [87] (p. 11). Quality of life encompasses a broad range of concepts, such as individuals’ physical fitness, mental health, social relations and beliefs system. The Organization for Economic Co-operation and Development (OECD) regards quality of life as a complex phenomenon that mainly consists of the following eleven factors: housing, income level, employment, social relations, education, environmental quality, civic engagement and governance, health, subjective quality of life, security and work–life balance [88]. Quality of life is satisfaction that comes from good health, comfort, social relationships, and cultural and intellectual conditions. Quality of life contains both objective and subjective aspects. The objective dimension points to the concrete aspects of the built environment. The subjective aspect encircles the individual’s contentment with certain aspects of life. Quality of life should not be considered static, and it can be controlled and modified. It can change positively or negatively. By improving the material and sociocultural milieu, the quality of life of individuals can be improved [74].

Well-being, as another key factor, is a multidimensional concept. It can be defined as the ability to satisfy one’s needs, the prospect to be productive and original, having security against violence and crime and having assured human rights [75]. It includes all aspects of human life, for instance, well-being, education, occupation, leisure, social relationships, political impact, security, and goods and services. Well-being factors normally can be categorized as follows: (1) Material concerns (income level, capital, employment, physical health and the quality of the environment); (2) Social relationships (family and acquaintances, support network, individuality, law and politics and inequalities); and (3) Subjective concerns (beliefs, religion, hopes, self-definition, fears and life satisfaction). The concept of well-being is highly subjective and person-specific. Well-being factors can vary from individual to individual, region to region, and culture to culture. Policies should emphasize making well-being reachable by providing condition that permit each individual to attain what will contribute to his/her well-being [80].

Achieving success in satisfying the social sustainability factors is an enormous task. It calls for a paradigm shift. The new paradigm envisions a world without chronic hunger, malnutrition, homelessness, illiteracy, unemployment, widespread diseases, armed conflicts, organized crime, corruption, terrorism, intolerance towards minorities, ethnic and religious groups and foreign occupations. Satisfying the mentioned factors is tremendously ambitious, especially considering the current extremely complex global circumstances.

In this context, sustainable development discourse is grounded in utopian thought. It formulates an alternative vision [66].

Recently, sustainability has become a vital concept with regard to the city. Terms such as sustainable city, urban sustainability and sustainable urban development are used interchangeably within the academic literature [89,90]. A city can be more sustainable if it is capable of enhancing its livability by providing employment, affordable housing, health, educational facilities, community services and public spaces [89,91].

As mentioned before, sustainable development consists of the following three pillars: economy, society and environment. With regard to slum upgrading, the aforementioned pillars attempt to create urban environments that are economically viable and socially just with better access to basic infrastructure. Such urban communities cause minimum negative impact on the environment. In terms of the economy, micro industries and small-scale enterprises can contribute to the informal urban economy. Slum upgrading projects can facilitate basic services such as safe water, sanitation, paved roads, electricity, affordable shelter and public services such as education and medical facilities. The aforementioned infrastructure can contribute to social equity and the well-being and quality of life of the slum inhabitants, and as a result contribute to the social sustainability. With regard to the environment, the sustainable use of water, sanitation, solid waste and local materials are vital [92].

The young architects in the fourth year curriculum are encouraged to visit certain slums, conduct fieldwork, gather data and develop insight regarding the current condition of the sites. They are expected to propose innovative proposals, such as establishing micro industries or small-scale enterprises, to enhance the local economy. The provision of basic infrastructure, public facilities, affordable houses and open spaces could be part of their design proposals. They are encouraged to search for innovative ways to reduce environmental pollution by providing clean water, managing waste, sanitizing and promoting proper building materials.

### *2.3. Social Sustainability in Architecture Education*

The discipline of architecture is responsible for designing buildings and landscapes where individual actions take place. Individual actions are determined by cultural and social necessities. Therefore, the architectural definition should not solely limit itself to the design and arrangement of physical spaces. In addition, it should include social relations among individuals and their society. The built environment's design impacts its occupants, the surroundings, and society [35,93]. In this context, architecture is responsive to social context in line with functional, technical, ethical, aesthetic, economic and psychological factors. A built environment contains public functions. It hosts social gatherings. It encompasses the social realm of people in a society. Therefore, the built environment can influence people's behavior in a society. The discipline of architecture with regard to the social aspect of sustainability plays a crucial role in facilitating spaces that support social life and provide spaces for people to engage with each other socially [35]. The discipline of architecture can provide the necessary infrastructure to the low-income sector of society, such as affordable housing, basic infrastructure, public spaces and educational and medical facilities, and by doing that, it can contribute to social equity and the well-being and quality of life of the aforementioned group.

The theoretical and practical solutions that are discussed during the weekly lectures in Graduation Research & Preparation (ARC 403) course and Graduation Project (ARC 402) course contribute to the following seven sustainable development goals (SDG), which have been defined by the United Nations [94]: goal one, end poverty; goal two, end hunger; goal three, ensure healthy lives and promote well-being for everyone; goal four, secure quality education for all; goal six, secure water and sanitation for all; goal eight, promote sustained economic growth; goal eleven, make urban centers sustainable. The final design proposals and projects should contain innovative solutions that positively contribute to the aforementioned sustainable development goals.

### 3. Materials and Methods

#### 3.1. Methodology

The proposed pedagogical framework is based on the review of the existing literature within the discipline of ethnography, architecture, urban design, landscape architecture and social sustainability discourse. In order to develop the necessary theoretical background for the proposed framework, the existing literature was reviewed and the relevant data were extracted within the following relevant materials: (1) Articles; (2) Book chapters; (3) Conference papers; (4) Theses. The literature review procedure that was used is as follows:

The fourth year curriculum consist of the following two major courses: (1) Graduation Research & Preparation (ARC 403) course and Graduation Project (ARC 402) course. The Graduation Research & Preparation (ARC 403) course is grounded on the following theoretical subjects: (1) Fieldwork theories; (2) Theories of slum upgrading; (3) Researching, selecting and analyzing successful design projects. Each subject contains theoretical backgrounds. In order to extract the necessary data for each subject, a review of the existing literature was conducted. The following keywords were searched on the Google and Google Scholar search engines: for Subject One, keywords such as “fieldworks ethnography”, “participant observation ethnography”, “interviewing ethnography”, “personal observation ethnography”, “sketching ethnography” and “visual documentation ethnography” were used.

For Subject Two, keywords such as “slum upgrading”, “basic infrastructure slums”, “basic infrastructure slum upgrading”, “tenure legalization slums”, “incremental construction slums”, “incremental housing slums”, “site and services slums”, “open spaces slums” and “urban agriculture slums” were utilized. For Subject Three, keyword “research in architecture studio” was used. Regarding the Graduation Project (ARC 402) course, keywords such as “research architecture studio”, “research architecture education”, “architecture studio social sustainability” and “design studio social sustainability” were searched.

The inclusion and exclusion criteria that have been applied are as follows: for Phase One, the title and abstract of the documents were screened and any article that was not relevant to the research topic or duplicated were excluded. For Phase Two, full texts were read, the relevant literature to the search topic was included in the review and the irrelevant texts were excluded. The selected literature had to be related to the proposed framework, it had to be written in English, peer-reviewed by experts in the field and published in reputable sources [95]. After applying the screening and the eligibility processes, 85 documents were identified for reviewing.

Full texts were read entirely in order to extract data. All the gathered data were analyzed by utilizing qualitative content analysis [96–98]. The content of each document was read, and the relevant data were extracted and summarized with notes instead of coding. All summaries were prepared manually and each summary describes the crucial points or aspects of the reviewed document. Summaries covering similar topics are categorized and labeled. The aim was to classify the data that belonged to a particular subject. All the gathered summarized pieces were synthesized and interlinked in order to make them concise and coherent. The authors were mindful not to alter the meaning of the data during note-taking, paraphrasing and interlinking the data. The end result was a refined and concise summary of the relevant literature.

The Graduation Studio (ARC 402) course utilizes a focus group methodology in order to establish an interaction between the studio lecturers and young architects. A focus group usually involves small number of participants in an informal group discussion. Both research participants and moderators (studio lecturers) focus on a particular topic during the feedback sessions. The role of the moderator is to encourage the research participants to interact [99,100]. The Graduation Studio (ARC 402) course regards design as a process, and it is grounded on a dialogue between the young architects and the studio lecturers. During the feedback sessions, the young architects share their design projects and receive feedback and critique.

There are other schools of architecture that focused on the slum upgrading topic. The Department of Architecture at the University of Pretoria in the academic year of 2016 also focused on the topic of informal settlements. The young architects within the aforementioned unit conducted various fieldwork sites in Woodlane Village located in Moreleta Park in the city of Tshwane in South Africa. The aforementioned unit also restructured its curriculum in 1999. The aforementioned unit, since the 1970s, has had a strong tendency to focus on sustainability discourse. The restructured curriculum mainly focuses on resource efficient design (RED). In the aforementioned model, the young architects were required to develop an empathetic understanding of necessities. They were required to be engaged in fieldwork and record the existing actual problems in a local context. They engaged in a mapping process in order to map the physical site condition. They were expected to reflect their fieldwork results in their design projects [23].

### 3.2. Research Process

The fourth year curriculum is based on an interdisciplinary approach to architecture and ethnography. Ethnography mostly focuses on social research [101,102]. Its principal characteristics can be summarized as follows: (1) It mainly focuses on the analysis of empirical data; (2) It primarily gathers data from the real world; (3) It is context-based; (4) Data are usually gathered from a range of sources; (5) It focuses on a single setting or a group of individuals; (6) It is mostly concerned with local and near communities rather than distant and exotic ones; (7) It is interpretive; (8) It values individual experiences, worldviews and perspectives, and attempts to record them; (9) It values inductive and discovery-based research process [102–105].

In order for the young architects to make an empirical investigation of individuals, their everyday practices and their lives and worlds, they were required to engage in fieldwork. In order to gather data, establishing long conversations with local participants and collecting data regarding their everyday actions are essential practices. In this context, a face-to-face relationship with locals matters [106]. The goal is to learn about people by learning from them [107]. Each young architect who experiences the process of fieldwork undertakes the following procedure: (1) Entering the field; (2) Establishing contact with gatekeepers; (3) Making contact with locals; (4) Collecting data; (5) Analyzing data.

### 3.3. Data Specification

Articles, books, book chapters, conference papers and theses were reviewed in order to extract data. All selected articles had to be research articles and published in peer-reviewed journals. All books and book chapters had to be published by reputable publishers.

As part of the objectives of the Graduation Research & Preparation (ARC 403) course, the course lecturers review and share ethnographical methods of data collection with the young architects during the weekly lectures. It is the task of the young architects to apply and contextualize the specific data collection methods during the fieldwork. The young architects who are interested in slum upgrading topic are expected to select one slum area, conduct fieldwork, utilize data collection methods and study the following items: (1) Urban density; (2) Natural features; (3) Accessibility; (4) Public spaces; (5) Housing typology; (6) Existing infrastructures; and (7) Public facilities. Each architectural design project should be based on the aforementioned analysis. Young architects were required to share the aforementioned analysis with the studio lecturers.

The reviewed ethnographic methods of data collection, which are covered during the weekly lectures within Graduation Research & Preparation (ARC 403) course, is as follows: (1) Participant observation; (2) Informal interviewing; (3) Walking and observing the site; (4) Mapping techniques; (5) Sketching on-site; and (6) Visual documentation. The young architects are required to utilize the aforementioned data collection methods during the fieldwork and study the seven items mentioned above.

### 3.4. Research Context

This research takes place at Department of Architecture at the Faculty of Architecture, Design and Fine Arts at Girne American University located in Kyrenia, Mersin 10, Turkey. The current updated fourth year architecture curriculum was revised in Fall semester 2011 and ran since then within the mentioned unit. The fourth year curriculum includes the following two courses: the Graduation Research & Preparation (ARC 403) course and the Graduation Project (ARC 402) course. One lecturer is responsible for the Graduation Research & Preparation (ARC 403) course and two lectures are assigned to the Graduation Project (ARC 402) course. The Graduation Research & Preparation (ARC 403) course supports the Graduation Project (ARC 402) course. Within the Graduation Research & Preparation (ARC 403) course, the young architects engage in research and gather the essential data that are necessary in delivering design projects in the Graduation Project (ARC 402) course.

The Graduation Project (ARC 402) course is conducted in a design studio titled “Graduation Project Laboratory”, which is reserved for the course. It contains thirty-five portable drawing tables and chairs for young architects to work individually or as a group. Approximately between twenty to thirty young architects enroll in the fourth year curriculum per year. The young architects can select the slum upgrade topic. The young architects are encouraged to go into the field and conduct fieldwork. The timeframe for conducting the field investigations is one academic semester (14 weeks). All the gathered data are presented in the Graduation Research & Preparation (ARC 403) course. The young architects are involved in the process of design in the Graduation Project (ARC 402) course, which contains a timetable for the design process. Young architects throughout the academic semester receive feedback, and their design projects are evaluated during the mid-term and final review weeks.

A young architect who is eager to focus on the slum upgrading topic is required to select one particular slum area. This young architect will be required to visit the slum and engage in fieldwork. The young architect will be advised to contact the gatekeeper in order to be able to access the site. It is highly recommended that the gatekeeper accompany the young architect during each fieldwork session. The young architect should spend time in the community, engage in mapping the community and understand the social and cultural context of the site. Interviewing and engaging in long conversations are part of the mapping process. Regarding the participatory design approach, the young architects are expected to interview the slum dwellers and reflect their voice in the design process.

### 3.5. Limitations

This research has the following limitations: (1) The proposed pedagogical framework solely focuses on design projects that deal with slum upgrading projects within the fourth year architecture curriculum. Other design project topics are outside the scope of the defined framework; (2) This research does not cover the young architects’ perception and feedback regarding the proposed pedagogical framework.

Regarding the proposed pedagogical framework, a young architect who is interested in the slum upgrading topic might face the following possible issues: (1) For a young architect with limited experience in fieldwork research, it is challenging to conduct fieldwork; (2) A young architect might not be able to access the site or establish contact with the gatekeepers; (3) A young architect might face difficulty in engaging in conversation with the locals; (4) Establishing trust within the local community might become a challenge; (5) A young architect should consider the safety issue since the slum area can be considered a hazardous environment; (6) Allocating sufficient time in order to collect data; (7) Allocating sufficient budget for the fieldwork.

#### 4. Research Design: Defining the Proposed Framework within the Fourth Year Architecture Curriculum

The fourth year architecture curriculum consists of the following two major courses: the Graduation Research & Preparation (ARC 403) and the Graduation Project (ARC 402). As part of the Graduation Research & Preparation course objectives, the young architects are required to find and define a social, environmental, or economic problem/issue, which is the slum upgrade topic. The young architects must engage in fieldwork and rigorous research and construct an inventory containing data. The gathered data should be presented cohesively using verbal and visual language in a thesis format. The Graduation Project (ARC 402) course is studio-based. The young architects utilize their theses as handbooks, and experience architectural design through a process that leads to a final design solution.

The following define the learning objectives and outcomes of the Graduation Research & Preparation (ARC 403) and the Graduation Project (ARC 402) courses. In the Graduation Research & Preparation (ARC 403) course, young architects are required to define a project topic within the scope of social, environmental, economic, and cultural sustainability and to conduct proper research for their graduation project. They must gather and present all their research findings and data in a project thesis. The final project thesis should demonstrate the research ability of the young architects, and should be based on coherent technical, visual, and verbal language. As the learning outcome, the young architects who complete this course will be able to: (1) Identify a topic for their graduation project within the scope of social, environmental, economic, and cultural sustainability; (2) Comprehend diverse research methodologies, utilize various methodological tools for gathering data and conduct analysis; (3) Present their research findings in a project thesis format; and (4) Apply verbal and visual skills to present their research findings in their project theses.

In the Graduation Project (ARC 402) design studio, young architects are required to operate the design as a -process-oriented activity and to define the design project's context and content. Once they reach the mentioned level, they must develop proper responses according to the needs and demands of the stakeholders. After analyzing and evaluating the given context and utilizing their project theses as an inventory containing data, they can propose their initial design proposals. By receiving regular feedback throughout the semester from the studio lecturers, the young architects can modify their design proposals and enhance their presentation skills. They are expected to use their problem-solving abilities and critical thinking to develop their design projects. They must integrate the knowledge and skills they acquired in other theoretical courses within the design process, from the idea generation down to the technical details. As the learning outcome results, the young architects who successfully complete this course will be able to: (1) Identify an architectural design project through a research-oriented process; (2) Use design methodologies with respect to the context and content of the project; (3) Evaluate design problems from multiple viable perspectives; (4) Propose design projects that are in line with environmental, economic and social sustainability principles; (5) Visualize the final design project by utilizing various representation techniques. In the following sections, a detailed explanation of the aforementioned courses in line with the specific pedagogical framework developed for them is presented.

##### 4.1. Graduation Research & Preparation (ARC 403) Course

In the Graduation Research & Preparation course, the following three phases have been defined for architectural design projects that focus on the topic of slum upgrade: Phase One, studying the site and context analysis; Phase Two, reviewing existing theoretical and practical solutions; Phase Three, researching successful slum upgrade design projects. The outcome of each phase is an inventory of the collected data. Each young architect is required to present the outcome of the above-mentioned three phases in a thesis format.

The aim of this course is to familiarize the young architects with two distinct data collection methods: fieldwork and research. Phase One utilizes fieldwork as an effective tool for collecting data [108]. Ethnographic tools of data collection such as: (1) Participant

observation; (2) Informal interviewing; (3) Walking and observing the site; (4) Mapping techniques; (5) Sketching on-site; and (6) Visual documentation are reviewed with the young architects. Once the young architects are familiarized with the aforementioned tools, they are required to engage in fieldwork and collect data. Phase Two and Three utilize research as the principal means of data collection [109]. A detailed explanation of each phase is as follows.

The main aim of Phase One (studying the site and context analysis) is to familiarize the young architects with the site and its context, so they can identify the inherent potentials and negative aspects of the site through conducting fieldwork in and around the site, familiarizing them with ethnographic methods of collecting data and encouraging the young architects to involve the slum dwellers in the analysis phases [110]. Slums are usually data-poor, highly heterogeneous, dynamic, and constantly in the process of incremental change. Slums can be considered complex landscapes governed by complex and dynamic processes [110–113]. Data collection methods utilized in ethnography can support young architects in obtaining an in-depth vision regarding the complex landscape of slums and the existing relationship between the slum dweller and their environment [114]. Exposing young architects to the primary source of materials enables them to come as close as possible to the realities being researched and studied [115]. The young architects are expected to engage in the following qualitative ethnographic methods of data collection: (1) Participant observation; (2) Informal interviewing; (3) Walking and observing the site; (4) Mapping techniques; (5) Sketching on-site; and (6) Visual documentation. A detailed explanation of each tool is as follows:

- (1) Participant observation: this can be defined as the learning process through exposure to various everyday routines and activities of locals in their environment. Participant observation can assist the young architects in documenting the way the community is organized, how individuals relate to one another, where individuals congregate and socially engage with each other, the type of activities that the slum hosts and the way physical and social boundaries are organized. The principal role of the young architect is to be physically present in the slum, accompany the dwellers, observe their daily routines and ask questions [116];
- (2) Informal interviewing: this comprises long casual conversations with various individuals that the young architect encounters during fieldwork. The long conversations can be regarded as a form of partnership between the young architect and the locals as insiders of the community. The partnership's outcome is to gain in-depth knowledge of the place [117]. Local slum dwellers can be regarded as key informants since they have inhabited the slum for an extended period. They have a vast knowledge of their environment and can pass their knowledge and know-how of the environment to the young architects [116,118]. The young architects are encouraged to record the narratives of the local people and engage in open-ended interviews if needed. In fact, slums, with their inherent complexity, require that the young architects as researchers expose themselves to the actual context, which involves actual individuals [23,119];
- (3) Walking and observing the site: the young architects are asked to walk in and around the site to understand/explore the site. They are required to walk the same routes locals use and record the existing pathways; the local pathways are the product of local people as frequent users. Walking slowly can be regarded as a tool for exploring the environment; it allows the observer to record existing details in the environment. Walking and observing the site unfolds its hidden inherent potential to the observer [120];
- (4) Mapping technique: young architects are encouraged to utilize mapping techniques and produce maps that illustrate the location and the type of social behavior on the site. They are encouraged to produce maps and identify the location of public places, existing building typologies and land use. They are expected to record the location of the existing routes, distances, and major natural features by using mapping techniques. Social mapping—as part of mapping the community—involves conversing with local

people to discover important locations, such as public places as meeting places, places of production, such as workshops or home-workshops, and how slum dwellers relate to the aforementioned places [116]. The young architects are required to use maps, aerial photographs, and application such as Google Earth, which are accessible to them. Maps as an effective tool can assist the young architect in comprehending the existing dynamics and complex social and physical layers of the city [121,122]. By comparing aerial photographs taken on various dates, the evolution and development of the slums can be studied;

- (5) Sketching on-site: the young architects must carry sketchbooks during the fieldwork and produce sketches on-site. This research regards sketching on-site as a distinct way of knowing the world. By drawing on location, the observer utilizes direct observation. While sketching on-site, a narrative starts to form, which is context-based. The drawing as an instrument can record the environment; it is informational, and explains the inherent complexity in the observed phenomena [123]. Drawing should not be solely regarded as an instrument for documenting the existing condition but as a creative tool that facilitates interactions with individuals, built environments, and landscapes [123,124]. The principal objective of producing drawings on-site can be summarized as following: (a) Drawing as a way to observe, register and comprehend the environment curiously; (b) Drawing as a means to focus on the slow and careful observation of the environment and people; (c) Drawing as a means to facilitate the young architect with context immersion [123,125];
- (6) Visual documentation: photography can be regarded as a method of displaying visual data. Similar to drawing on-site, photography is also context-based. Photography is an effective tool for documenting individuals, places, landscapes, and events. It can visualize contextual complexities difficult to explain via narrative text [122]. In some cases, photographs were used to produce drawings, such as drawing by observing a photo or drawing on a photo; the aforementioned methods are effective tools for visualizing data [123]. In addition to the aforementioned methods, collages are made by mixing drawings and photographs. Aerial photographs, visual documentation, sketching, and mapping are low-cost instruments that enable detailed mapping in situ [126].

During the initial phase of fieldwork, young architects usually face challenges accessing the slums. To solve the issue of accessing slums, young architects are advised to find gatekeepers. The gatekeeper can grant direct access to the slum's residents as a source of data and introduce the young architect to the slum's residents [127]. The gatekeeper usually accompanies the young architect as a researcher during the fieldwork to assist the young architect with establishing contacts with the locals, conversing with the locals, and mapping the slum. In addition, the gatekeeper, as an individual who is familiar with the slum, can assist the architect to understand local issues and highlight the existing problems better [128,129].

Conducting regular fieldwork in slums involves the direct interaction of young architects with local people. Regular close interactions can lead to instances that certain members of the population under study are harmed in some ways. Therefore, young architects must be mindful of the proper ethical conduct of research. According to the faculty board recommendations concerning ethics in research, all the research participants must provide their oral consent regarding participating in research. They are required to agree that their identities will be revealed, and they should also agree that their photos are taken [117].

The principal outcome of Phase One can be summarized as follows: (1) The young architect can gain an in-depth insight regarding the site and its context; (2) Conducting fieldwork provides an opportunity to engage with the local people; (3) Local people, over time, have developed local solutions to their immediate issues. The young architect can identify and record local solutions by conducting fieldwork on different occasions; (4) The existing potentials of the site can be identified (Table 1).

**Table 1.** Phase One framework (developed by authors).

Phase One
Conducting fieldwork and utilizing the following data collection tools: (1) Participant observation; (2) Informal interviewing; (3) Walking and observing the site; (4) Mapping technique; (5) Sketching on-site; (6) Visual documentation.
<b>Phase One outcomes:</b> (1) Gaining in-depth insight regarding the site and its context; (2) Establishing connections with locals; (3) Identifying local solutions; (4) Identifying the site's potential.

The principal focus of Phase Two is familiarizing the young architects with the existing theoretical and practical solutions for upgrading the slums. The course lecturer's task is to provide the necessary theoretical background during the weekly lectures. Weekly tutorials and lecture sessions play a crucial role in enhancing young architects' critical thinking skills [130]. The following six theoretical and practical solutions are shared with the young architects: (1) Providing basic infrastructure; (2) Tenure legalization; (3) Self-built incremental housing and sites and services; (4) Provision of community facilities; (5) Upgrading open spaces; and (6) Enhancing of income-earning opportunities [131].

The young architects are required to research and study the aforementioned theoretical and practical solutions throughout the semester. The young architects during the fieldworks should study the site. They should utilize the ethnographic tools for data collection (participant observation, informal interviewing, walking and observing the site, mapping technique, sketching on-site and visual documentation) and record the current condition of the site with regard to: (1) Basic infrastructure; (2) Tenure legalization; (3) Housing condition; (4) Existing community facilities; (5) Current condition of open spaces; and (6) The existing small-scale workshops and industries. The young architects are required to propose innovative architectural and landscape solutions to enhance the current condition of the site by considering the above-mentioned theoretical and practical solutions (providing basic infrastructure, tenure legalization, self-built incremental housing, sites and services, provision of community facilities, upgrading open spaces and enhancing income-earning opportunities). A detailed explanation of the six theoretical and practical solutions that is shared with the young architects is as follows.

The first topic covered during the weekly lectures provides basic infrastructure, including water, sanitation, and electricity. Lack of basic infrastructure can negatively affect the slum dwellers' quality of life, health, and social well-being; therefore, it is vital to address it [132–134]. Concerning water and sanitation, a bottom-up approach can be utilized. The bottom-up approach can be defined as services facilitated by non-government organizations or NGOs. The bottom-up approach utilizes a high degree of decentralized planning and implementation. The bottom-up approach can mobilize the slum dwellers and involve them physically and financially in the service delivery process. In this way, the slum dwellers develop a sense of ownership over the infrastructure. Local governments and NGOs can establish water trust to assist the community in addressing their water shortage [134,135].

Concerning sanitation, slum dwellers' contributions in planning and fulfilling their sanitation demands are crucial [134,136,137]. The lack of slum dwellers' participation can negatively affect access to sanitation services [134,138]. Local NGOs can approach and engage the slum dwellers in the planning, designing, constructing, and maintaining the sanitation infrastructure. Slum dwellers, by receiving assistance from the local NGOs, can construct the sewage infrastructure, while the local government can provide a connection to the city sewage network. As a result of this partnership, slum dwellers can receive household-level connections in addition to the connection to the city network. The bottom-up approach is vital for water and sanitation since it can address context-specific issues [135].

Concerning electricity, local governments usually face the following challenges: (1) Security of tenure; (2) Low electricity consumption; (3) Difficulty in monitoring and payment collection; and (4) Electricity theft. Most slum dwellers access electricity through illegal connections due to the electricity cost and high upfront costs. It is with the support of the local governments and local NGOs that the issues of security of tenure, non-payment, and illegal connection can be resolved [134,135].

Tenure legalization is the second solution that is discussed during the weekly lectures. Concerning tenure legalization, slum dwellers can be divided into the following four distinct categories: legalized and non-legalized landowners, resident structure owners, non-resident structure owners and tenants. A community land trust can be considered as an alternative solution to tenure legalization; it attempts to safeguard the common interest of the stakeholders. The land legalization in the community land trust system contains the following principles: (1) The community land trust is a community-based and non-government organization; and (2) The land is registered under the community land trust title. Community land trust moves beyond the land as a commodity for profit generation; the land in this vision is utilized by slum dwellers' needs; (3) The land is leased to the slum dwellers who live in the slum; (4) Slum dwellers own the structure that they have already built or intend to build on the land; (5) Slum dwellers can sell their structure at a regulated price, which is issued by the trust; thus, the affordability of existing structures will be preserved; (6) The trust can provide technical assistance to the slum dwellers concerning slum management and development [139–141].

Concerning the land, the following possible scenarios are applicable: (1) The local municipality or government can donate the public land to the community land trust; (2) Individuals or private or public organizations can donate private land to the community land trust; (3) The community land trust can purchase private land, which requires raising funds via private donations, grants, bank loans or government loans [139]. Registering the land under the community land trust separates the land from the speculative real estate market; therefore, the land value equation is eliminated, and the land becomes accessible to all slum dwellers. Community land trust schemes can pave the way for a long-term affordable incremental development in slums [139,141].

Regarding land ownership, the following three distinct categories exist: non-landowners, legalized landowners, and non-legalized landowners. The aforementioned stakeholders can cooperate with the community land trust and, in the long term, become legalized structure owners. Non-landowners (tenants, resident structure owners and non-resident structure owners) in the long term can become legalized structure owners and build/maintain or expand (horizontally or vertically) their structures. Legalized landowners (vacant landowners/land-owners with the built structure on it) and non-legalized landowners can transfer/sell their land title to the community land trust and become legalized structure owners. The aforementioned stakeholders also can build/maintain or expand (horizontally or vertically) their structures. All stakeholders receive technical assistance from the community land trust (Table 2).

The third existing solution discussed during the weekly lectures, is incremental self-built housing. In this approach, the slum dwellers are regarded as laborers who can be empowered by being enabled to construct their dwellings in a self-build process. The housing issue of slum dwellers cannot be solved entirely by solely relying on traditional policies and government programs, which are usually geared to construct and directly deliver subsidized finished homes. Government-based schemes are usually capable of offering a limited number of dwellings [142,143]. Alternative approaches, such as incremental self-built housing, are necessary to enhance the living conditions in slums [144]. Incremental housing can be defined as a systematic process in which residents construct, upgrade and extend their dwellings by themselves whenever capital, building materials, and time are available [144–147]. Concerning capital, slum dwellers usually utilize a fluid network of informal financial sources to build their own houses since they usually do not have access to affordable loans from formal financial institutions [148,149].

**Table 2.** Land ownership categories and possible solutions (developed by authors).

Categories	Stakeholders/Required Action	Long-Term Benefits
Category A: Non-land owners	Tenants	Empowered to be legalized structure owners
	Resident structure owners	Maintain the current structure/incremental horizontal or vertical expansion/legalize the structure
	Non-resident structure owners	Maintain the current structure/incremental horizontal or vertical expansion/legalize the structure
Category B: Legalized land-owners	Vacant land-owners/transfer the land title to the Community Land Trust	Build structure/legalize the structure/receive technical assistance from community land trust/become legalized structure owners
	The land owners with a built structure on it/transfer the land title to community land trust	Maintain or expand the current structure/legalize the structure/receive technical assistance from community land trust/become legalized structure owners
Category C: Non-legalized land-owners	Transfer the land title to community land trust	Built, maintained or expanded the structure/legalized the structure/received technical assistance from community land trust/become legalized structure owners

Incremental housing can be regarded as an affordable way of housing because residents utilize their labor power during the construction phase. The step-by-step process allows the residents to construct their dwellings whenever the construction fund is available; it can take up to five to ten years to obtain a house [144,146–148]. A study conducted in Mumbai and Chennai in India shows that the plot owners took approximately twenty years to accumulate sufficient capital to construct their houses. Most plot owners slowly completed their houses, added additional floors, and expanded their houses vertically [150].

By engaging in incremental housing, slum dwellers can elevate themselves to skilled laborers once they have acquired sufficient construction skills [147]. Usually, slum dwellers would participate in incremental housing and dedicate their time, capital and labor if the legality of their residential status or security of tenure is resolved [144,151].

The following fundamental factors should be addressed in the self-help incremental housing scheme: (1) The scheme should provide a training program for teaching construction skills; (2) Slum dwellers should be able to produce affordable building materials on-site, such as cement blocks and bricks; (3) It should provide temporary accommodation for slum dwellers during the construction phase. In this context, local NGOs, municipalities, and local governments can provide legal and technical assistance such as: (1) Organizing construction workshops; (2) Allocating land; (3) Supplying construction materials; and (4) Addressing the regulatory framework of the houses. The aforementioned scheme is based on bottom-up development by engaging the slum residents supported by top-down assistance provided by local NGOs, municipalities and governments [146].

Under the sites and services approach, local governments and municipalities allocate land and provide basic services such as water supply, electricity supply, road network, sewage, drainage system and other municipal services. The aim is to provide plots of land with infrastructure to low-income people. The plot owners' task is to construct their houses incrementally [142,150,152,153]. The key components of the sites and services scheme

are the provision of the plots of land and the essential infrastructure [142]. The sites and services model can be regarded as an informal housing delivery system based on a premise of self-building. Advocates of the sites and services model believe that homeowners are well aware of what type of housing they need and that they can actualize it [150,154,155].

The provision of public facilities is the fourth topic that is reviewed during the weekly lectures. Public facilities include schools, medical centers, transport terminals, marketplaces, recreational facilities and other facilities. Usually, slums suffer from poor living conditions. The living conditions in most slums are a risk to the slum dwellers' health. Slum dwellers are usually more vulnerable to communicable diseases and outbreaks. In this regard, the provision of medical centers is essential. With regard to education, slum dwellers have the lowest literacy rate. Usually, the low-income young individuals residing in urban centers are less educated than those in rural areas. It is crucial to invest in young people's skills to yield economic growth. The provision of public transport is another vital issue since most slum dwellers rely on informal or formal public transport, walking and cycling. The provision of paved roads, bike lanes and pathways is essential to make walking and cycling safe, which may guarantee safe access to the site for locals, as well as non-residents and other visitors [20].

The fifth topic covered during the weekly lectures, is upgrading the open spaces in slums. Open spaces are considered shared outdoor areas, streets, alleys and other multifunctional pocket spaces [156,157]. Open spaces are where the economic and social activities of slum dwellers are facilitated [9]. Open spaces are common grounds that play a substantial role in animating the social living of communities. They are produced and transformed socially by the slum dwellers. They are self-developed and self-managed without professional or local government interventions [158–161].

Open spaces, such as streets, squares, parks, and playgrounds, should be created because they are key components in strengthening the communities of the slums [110,159]. Open spaces with properly designed plans may play a crucial role in enhancing slum dwellers' well-being and health, supplying economic opportunities, and fostering community ties while serving other productive functions. Open spaces are usually where slum dwellers can socialize, enjoy fresh air, engage in informal economic activities, perform domestic routines, cultivate food and engage in recreational activities [112,156,162].

Open spaces are crucial for low-income slum dwellers who reside in congested houses with low-quality indoor spaces. Usually, in slums, the size of the houses is less than adequate; therefore, residents extend their various everyday activities into the adjacent available open spaces. Slum dwellers usually extend their houses into the streets. Front houses are usually converted into private storage areas, new rooms, or workshops. In this way, part of the streets is converted into private uses. Additionally, slum dwellers privatized available public spaces for common household activities such as socializing, seating, cooking, laundry, and cultivating food [112,156]. In fact, in an overcrowded environment such as the slums, the residents prefer to increase the quantity of space for personal use [156,163].

Usually, slum dwellers remain in open spaces as long as they are functional and relevant to their everyday activities and adapt or abandon open spaces if they are not. A successful open space in a slum is usually semi-private rather than public. It is multifunctional and useful [156]. In this regard, studio lecturers encourage the young architects to understand and consider the slum dwellers' preferences and needs concerning open spaces. The slum dwellers, as local experts, have a profound knowledge of their environment, which should be considered during the data collection and design process [164].

The sixth topic reviewed during the weekly lectures is the enhancement of income-earning opportunities. Urban agriculture can be considered a practice capable of generating income for the slum dwellers. In this research, urban agriculture is defined as "growing fruits, herbs, and vegetables and raising animals in cities, a process that is accompanied by many other complementary activities such as processing and distributing food, collecting and reusing food waste and rainwater, and educating, organizing, and employing

residents” [165] (p. 13). The practice of animal husbandry and horticulture can also be categorized under urban agriculture.

In this vision, slum dwellers with rural backgrounds equipped with the knowledge of cultivation are empowered to engage in urban agriculture [166]. The vacant parcels in and around the slums can be converted into community gardens, and slum dwellers, by engaging in urban agriculture, can benefit economically. Urban agriculture can be considered an economic activity; it provides employment opportunities for slum dwellers. For slum dwellers with limited income, urban agriculture can be considered a rational solution for generating income [167–170]. Slum dwellers as urban farmers, are empowered to supply their families and the urban market with fresh food [159]. Urban agriculture can improve the quality and quantity of the food available to the slum dwellers. It can act as a food security strategy for low-income urban dwellers [168,171,172].

Additionally, urban environments can be fundamentally transformed in terms of food cultivation, if food produced by self-sufficient environments is consumed. Fresh food can be distributed via short circuits, and a common ground can be created where urban-farmer—in this case, slum dwellers—socialize and interact with the urban inhabitants [166,173,174]. By integrating cultivating grounds/plots into the fabric of the cities, a closer bond between the rural and urban lifestyle and a human social network can be established [175].

Proposing urban agriculture as an economic activity is feasible when the following criteria are attended to: (1) There is a bottom-up request from the community; (2) There is a partnership between the community and local organizations; and (3) The specific demands of the slum dwellers are met [9,156,176]. Proposing the specific type of vegetation valued by and relevant to the community members, such as medicinal plants, will probably lead to the continuing success of the urban agriculture scheme [156,177].

Phase Two outcomes can be summarized as follows: (1) The young architects are familiarized with existing theoretical and practical solutions regarding slum upgrade; (2) Regarding the aforementioned theoretical and practical solutions, the young architects are expected to engage in research and present their findings in their theses (Table 3).

**Table 3.** Phase Two framework (developed by authors).

<b>Phase Two</b>
Theoretical discussions during the weekly lectures: (1) Providing basic infrastructure; (2) Tenure legalization; (3) Self-built incremental housing and sites and services; (4) Construction of community facilities; (5) Upgrading open spaces; and (6) Enhancement of income-earning opportunities.
<b>Phase Two outcomes:</b> (1) The young architects are familiarized with existing theoretical and practical solutions; and (2) The young architects have engaged in research and present their research findings in their theses.

In Phase Three, each young architect must engage in rigorous research and study, and select relevant case study precedents. Young architects are strongly encouraged to analyze and identify the existing innovative design patterns in each selected case study. Design patterns are divided into: (1) Design concepts; (2) Architectural design solutions; and (3) Landscape design solutions. Each selected case study is based on certain design concepts. Architectural design solutions can be categorized as architectural forms, functions, spatial organizations, structures, buildings with landscape relations and environmental and technical solutions. Landscape design solutions can be summarized as innovative solutions for designing open spaces, public facilities and infrastructure. By studying and analyzing the successful case study precedents, the young architects can build an inventory containing design patterns (Table 4).

**Table 4.** Phase Three framework (developed by authors).

Phase Three
1. Engage in rigorous research and study, and select relevant case study precedents; 2. Identify innovative design patterns for each selected case study. Design patterns include: (1) Design concepts; (2) Architectural design solutions; and (3) Landscape design solutions.
<b>Phase Three outcomes:</b> (1) Building an inventory of design patterns; (2) Presenting their inventory of design patterns in their theses.

Conducting research is an essential component of Phases Two and Three. The slum can be regarded as a complex landscape that contains economic, social, and environmental issues. It can be seen as a wicked problem [109,178]. The slum as a wicked problem requires young architects to engage in rigorous research to propose design solutions. Research is crucial in studying the existing theoretical and practical solutions. The research includes investigating current strategies, schemes, solutions and methods. Research is analytical. It contains speculation, creative exploration, and critical evaluation [109,179]. By applying research, the young architects investigate current theoretical perceptions and practical solutions regarding slum upgrading. They analyze the key role that architecture and landscape architecture plays in slum upgrading projects. In fact, research provides insights into potential theoretical and practical solutions and future design directions.

The Graduation Research & Preparation (ARC 403) course and the Graduation Project (ARC 402) studio, in addition to being delivered in a teaching environment, can be seen as a research platform. Research assists young architects in acquiring the skill of “learning to learn” [180]. By engaging in research, young architects can envision possible realities and change the existing reality by implementing a new one [27].

#### 4.2. Graduation Project (ARC 402) Design Studio

In the undergraduate architecture curriculum, architecture design studio is the most crucial subject with the highest weekly credit hours. It has a central position in architecture education [25,27,180–183]. In architecture, a design studio refers to a pedagogy, event, and environment. A design studio is a physical space for young architects to engage in their design projects. In addition, the design studio is based on a pedagogy that is centered around solving particular design problems by utilizing knowledge and tools [22,184].

Design as the principal activity in a design studio can be regarded as a vital human activity because it bridges theory with practice and scientific activities with creative ones to deal with complex issues [185]. Additionally, the architecture studio is a practice field in which young architects are engaged in simulations of real situations they will experience after they graduate in the professional realm [26,186].

The principal aim and objectives of the architecture design studios can be summarized as follows: (1) Educating innovative and creative young architects to be responsive to the demands of society; (2) Equipping young architects with the necessary expertise and knowledge to propose innovative and creative design solutions [180]; (3) Educating young architects to be creative and flexible problem-solvers. Young architects should be able to think critically. They should be capable of analyzing and synthesizing data to solve complex problems; (4) The young architects should be able to: (1) Acquire data; (2) Analyze data; and (3) Synthesize data [187].

Design can be considered the principal activity in the architecture design studios. The nature of design is explorative and innovative. It attempts to exceed the limits of the body of knowledge both in a theoretical and methodological way. It explores several possible answers to a series of complex problems. Design includes testing various concepts, technologies, and materials [109,188]. It focuses on developing innovative conceptual ideas. Design requires research into cultural, social, economic, and aesthetic issues [109]. Design envisions what the future might be. It concerns itself with how things turn out to be [189,190]. Design is constructive. It generates ideas that need to be tested [109,188].

Each design project within the architecture design studio follows a systematic process [191]. The design process is regarded as an educational learning experience [22]. The design studio commences by considering a site and its complex context. At this stage, the young architects would have already visited the site, conducted fieldwork on multiple occasions and documented the existing condition of the site. The young architects are well-aware of the site's inherent potentials and existing issues. The young architects are encouraged to consider the negative and positive aspects of the site and reflect on the voice of the local people during the design process. The site and its complex context can be regarded as a ground where further design can be developed.

The first phase contains the following procedures: (1) The young architects must adopt applicable and relevant theoretical and practical solutions, considering the site and its context. The outcome of this process is contextualized within the theoretical and practical solutions, which are entirely responsive to the site and its context; (2) The young architects must interpret the selected design patterns from the successful case studies by considering the site and its context. The outcome of this process is the contextualized design patterns [180]; (3) At this stage, the young architects can propose the initial design proposals, which are possible design solutions to a series of existing issues.

During the semester, the young architects present their initial design proposals (drawings, sketches and physical models) to lecturers during the feedback sessions. The aim of each feedback session is as follows: (1) To stimulate the young architects' reflection on and discovery of their developing knowledge by asking questions and receiving feedback; (2) To push the young architects' design ideas further; (3) To encourage them to engage in a variety of studies that are integral to the development of their initial design proposals; (4) To encourage them to engage in problem-solving activities by applying critical thinking to respond to the design issues that arise during the design process [22,26].

The majority of the feedback sessions are one-to-one interactions; however, there are instances when lecturers gather the young architects around a table for an important feedback session [26]. The studio lecturers regard design as a process. By receiving regular feedback and critique, the young architects can refine and develop their initial design proposals. In this context, the design proposals are never complete. They are always on a pathway toward better iterations [109,192]. A successful design proposal is the outcome of a process that consists of a series of critiques and feedback from the studio lecturers [109,185]. Design is a collaborative learning process that is grounded on a continuous dialogue between the young architects and the studio lecturers [193]. The design studio is based on a culture that values conversation, continuous dialogue, asking questions, and giving and receiving feedback.

During the second phase, the young architects must make sure that contextualized theoretical and practical solutions function appropriately and that contextualized theoretical and practical solutions are involved properly with contextualized design patterns. At this stage, contextualized design patterns should function accurately and engage with each other as a unified system of patterns. The outcome of Phase Two is the initial final design proposal. The final design project is actualized once the entire design project functions holistically. The final design project should meet the following criteria: (1) It should be responsive to the site and its context; (2) It should propose design solutions to a series of existing environmental, social and economic issues; (3) It should be responsive to the core concept of social sustainability in line with economic and environmental sustainability; (4) It should propose innovative context-based architecture and landscape solutions; (5) It should raise social awareness and encourage participation. Similar to Phase One, the process of presenting the design project and receiving feedback regularly is vital to the refinement of the design project.

The core concepts of social sustainability, such as social equity, well-being, and quality of life, are discussed with the young architects by organizing periodical supplementary theoretical lectures within the design studio. Young architects are required to engage in research and critically evaluate each core concept. Studio lecturers and young architects engage in regular one-to-one dialogue concerning the ways in which design projects could contribute to the core concepts of social sustainability. Studio lecturers organize regular consultation sessions for each young architect during the semester. During each session, the studio lecturers focus on each project, try to attend to the specific issues in each project, and consider various ways the design project could be socially responsive. Part of the objectives of the design studio is to deliver design projects that apply a series of design decisions that contribute to enhancing the core concepts of social sustainability.

Critical thinking can be regarded as a cornerstone of the architecture design studios. The role of an architecture studio is to prepare young architects to be critical of the knowledge they acquire rather than solely providing educational information for them [180]. Critical thinking can be defined as the process of questioning, evaluating, reasoning objectively and contextualizing in a particular discipline [194]. Critical thinking is necessary in establishing a culture of thinking [195]. By applying critical thinking, young architects are empowered to engage in rational problem-solving activities during the design process [29]. Table 5 demonstrates the pedagogical framework established for the Graduation Project (ARC 402) course. It consists of Phase One, Phase Two and Phase Three.

**Table 5.** Proposed framework for Graduation Project (ARC 402) studio (developed by authors).

Phase One	Phase Two	Phase Three
1. Contextual theoretical and practical solutions; 2. Contextualized design patterns; 3. Considering social sustainability indicators: social equity, well-being and quality of life.	1. Making sure theoretical and practical solutions function appropriately; 2. Contextualized design patterns should function accurately; 3. Contextualized design patterns should engage with each other accordingly; 4. Design proposal should enhance the well-being and quality of life of stakeholders and contribute to their social equity.	Final design proposal representation
Initial design proposal	Initial final design proposal	Final design

Bellow, both frameworks developed for Graduation Research & Preparation (ARC 403) and Graduation Project (ARC 402) courses (see Tables 6 and 7) are presented.

**Table 6.** Proposed framework for Graduation Research & Preparation (ARC 403) course (developed by authors).

Phase One
Conducting fieldwork and utilizing the following data collection tools: (1) Participant observation; (2) Informal interviewing; (3) Walking and observing the site; (4) Mapping technique; (5) Sketching on-site; and (6) Visual documentation.
<b>Phase One outcomes:</b> (1) Gaining in-depth insight regarding the site and its context; (2) Establishing connections with locals; (3) Identifying local solutions; (4) Identifying the site’s potential.

**Table 6.** *Cont.*

Phase Two
Theoretical discussions during the weekly lectures: (1) Providing basic infrastructure; (2) Tenure legalization; (3) Self-built incremental housing and sites and services; (4) Construction of community facilities; (5) Upgrading open spaces; and (6) Enhancement of income-earning opportunities.
<b>Phase Two outcomes:</b> (1) The young architects are familiarized with existing theoretical and practical solutions; and (2) The young architects engage in research and present their research findings in their theses.
Phase Three
1. Engaging in rigorous research and study, and selecting relevant case study precedents; 2. Identifying innovative design patterns for each selected case study. Design patterns include: (1) Design concepts; (2) Architectural design solutions; and (3) Landscape design solutions.
<b>Phase Three outcomes:</b> (1) Building an inventory of design patterns; (2) Presenting their inventory of design patterns in their theses.

**Table 7.** Proposed framework for Graduation Project (ARC 402) studio (developed by authors).

Phase One	Phase Two	Phase Three
1. Contextual theoretical and practical solutions; 2. Contextualized design patterns; 3. Considering social sustainability indicators: social equity, well-being and quality of life.	1. Making sure theoretical and practical solutions function appropriately; 2. Contextualized design patterns should function accurately; 3. Contextualized design patterns should engage with each other accordingly; 4. Design proposal should enhance the well-being and quality of life of stakeholders and contribute to their social equity.	Final design proposal representation.
<p>Receiving regular feedback.</p>	<p>Receiving regular feedback.</p>	
Initial design proposal	Initial final design proposal	Final design

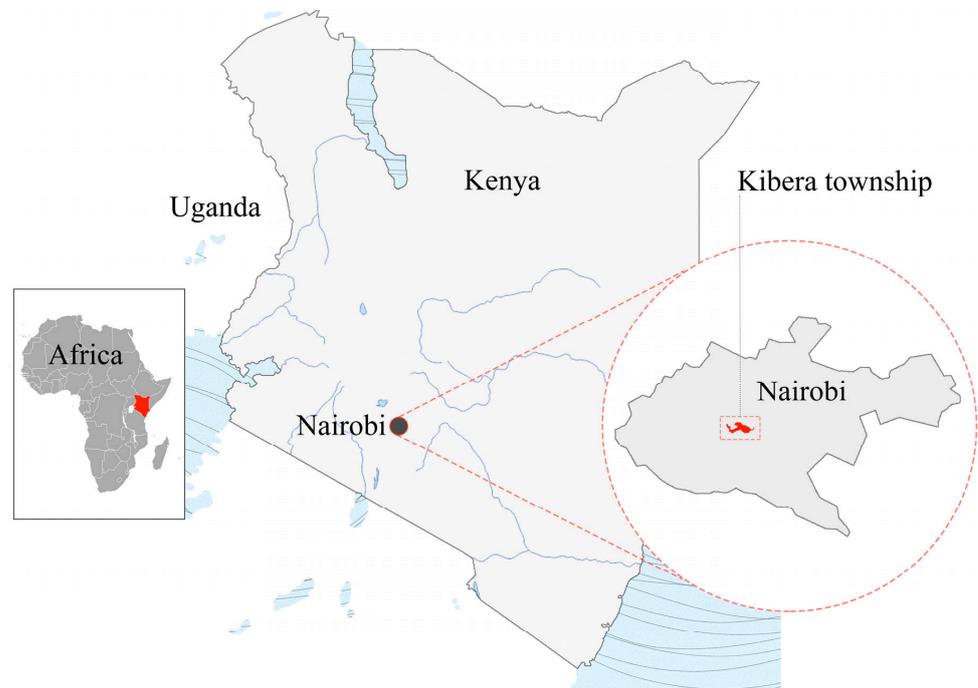
### 5. Results

In the Graduation Research & Preparation (ARC 403) course, the young architects learn the following: (1) The young architects are familiarized with studying the site and conducting context analysis. They are introduced to ethnographic tools for data collection; (2) The young architects experience the process of conducting fieldworks; (3) They experience the process of data collection in real-life situations; (4) They learn the process of developing innovative architecture and landscape solutions in order to enhance the current condition of the selected site by considering the existing theoretical and practical solutions such as: (1) Providing basic infrastructure; (2) Tenure legalization; (3) Self-built incremental housing and site and services; (4) Provision of community facilities; (5) Upgrading open spaces and (6) Enhancing income-earning opportunities; (5) they learn to engage in research, study and select relevant case studies. They experience the process of building an inventory of design patterns.

In the Graduation Project (ARC 402) design studio, the young architects learn the following points: (1) As young architects, their design projects should be responsive to the demands of society; (2) They experience the process of developing innovative design proposals in order to improve slum condition; (3) The young architects experience the process of developing design projects by considering the site and its context; (4) The young

architects experience design as a process; (5) They learn about the key indicators of social sustainability and how architecture design projects can positively contribute to them.

The following will present one sample design project developed in the Graduation Research & Preparation (ARC 403) and Graduation Project (ARC 402) courses. The objective of the design project is to upgrade the Kibera slum located in Nairobi, Kenya. The young architect selected the slum upgrade topic as part of the requirements of the ARC 403 course. As mentioned before, the Graduation Research & Preparation (ARC 403) course consists of three phases. Phase One focuses on collecting data, studying and analyzing the site and its context by conducting fieldwork on various occasions. As part of the requirements of Phase One, the young architect conducted fieldwork on various occasions to study the followings: (1) Urban density; (2) Natural features; (3) Accessibility (major and minor roads and pathways); (4) Public spaces (street fronts and local gathering spots); (5) Housing typology; (6) Existing infrastructures; and (7) Public facilities (schools, clinics, religious institutes and government offices) (see Figures 4–13).



**Figure 4.** The location of Nairobi and Kibera township [196].



**Figure 5.** Urban density at Kibera slum [196].



Figure 6. The location of intermittent streams [196].



Figure 7. Primary and secondary transport networks [196].

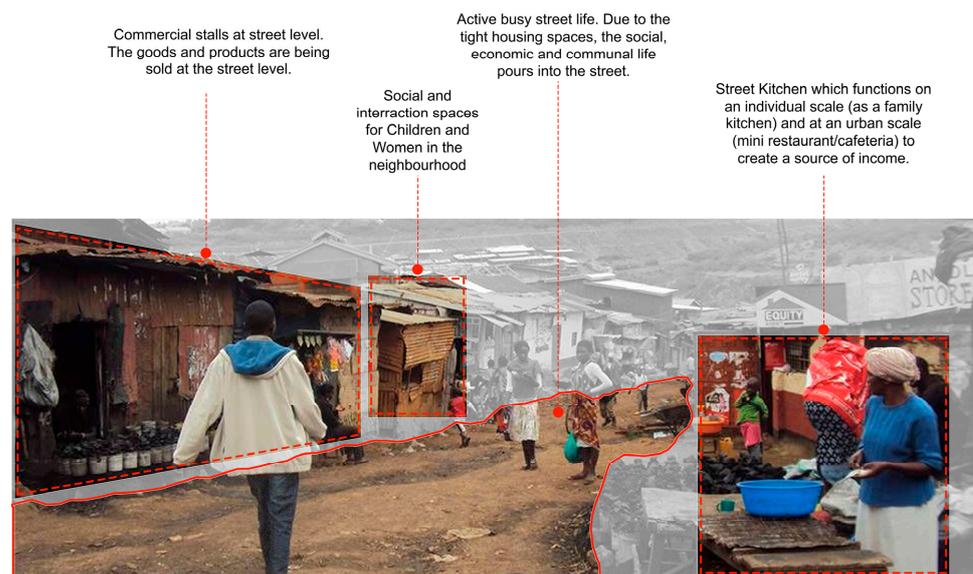


Figure 8. Street front used as public space [196].

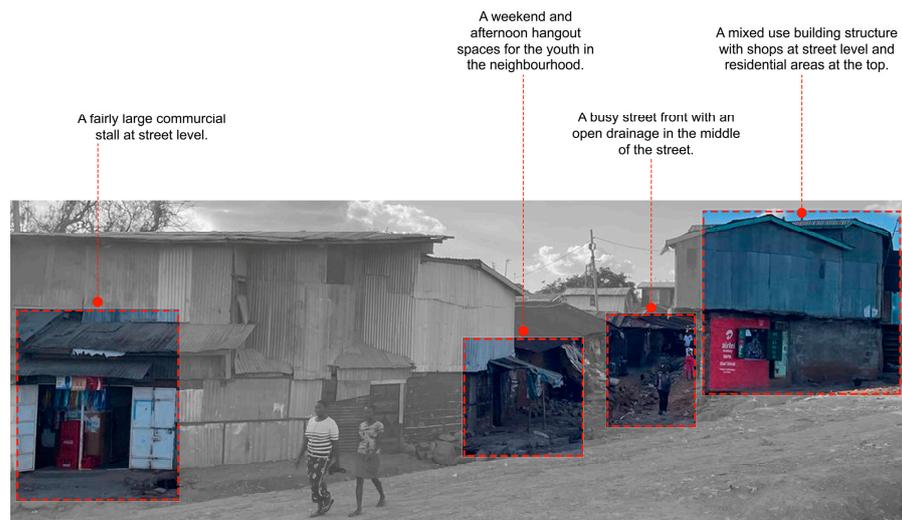


Figure 9. Street acts as a public space [196].

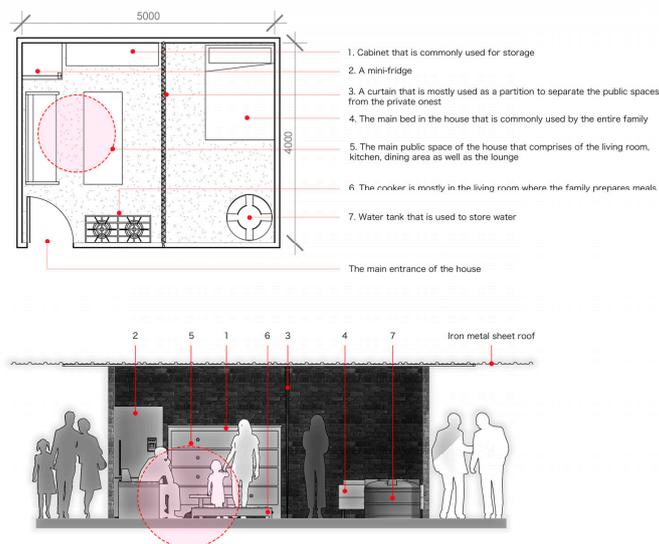


Figure 10. Existing housing typology [196].

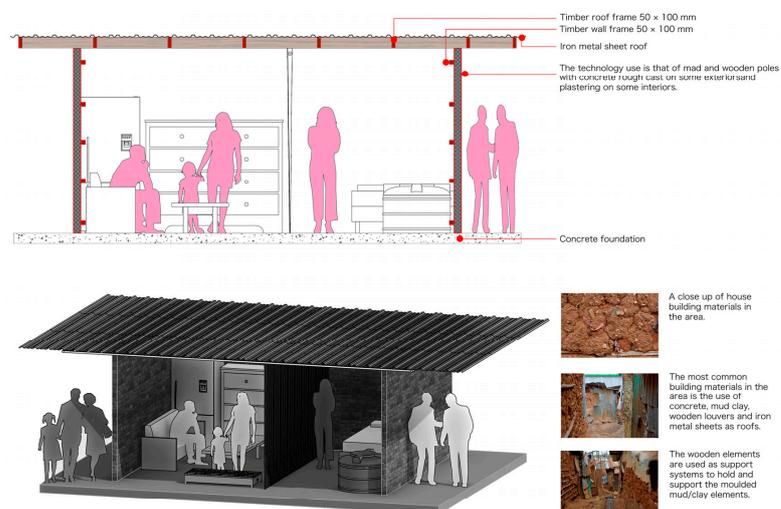


Figure 11. Housing typology [196].

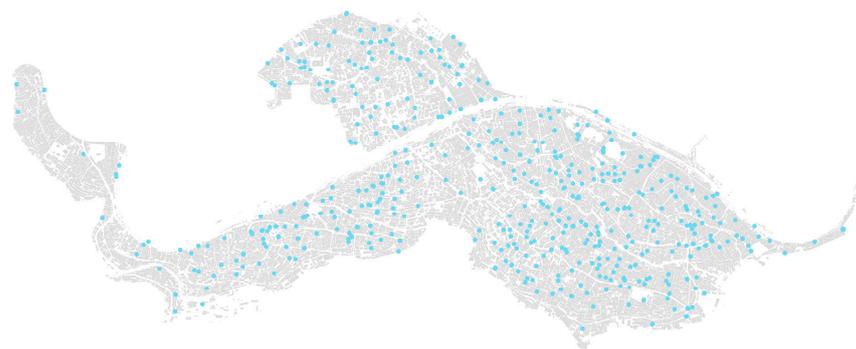


Figure 12. Existing water tanks [196].

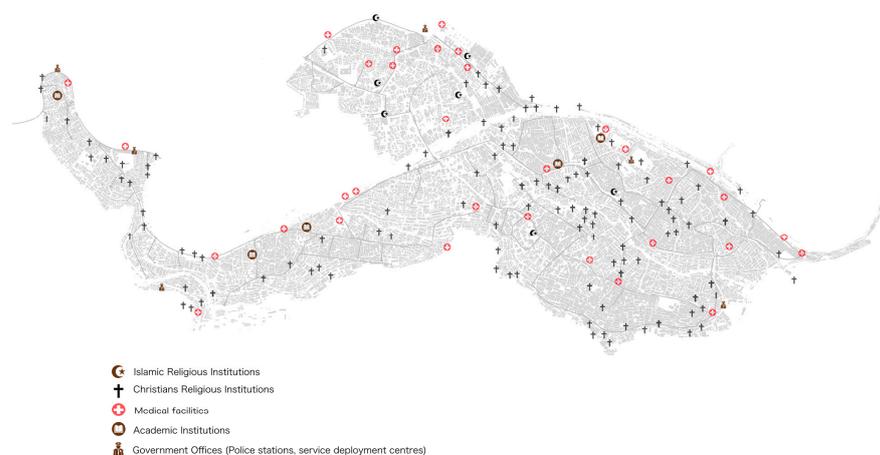


Figure 13. Existing public facilities [196].

The young architect conducted fieldworks and utilized ethnographic tools for data collection (participant observation, informal interviewing, walking and observing the site, mapping techniques, sketching on-site and visual documentation) in order to map the current condition of the site. The aim of the design project is to enhance the current condition of the site by proposing innovative architecture and landscape solutions by considering theoretical and practical solutions such as: (1) The provision of basic infrastructure; (2) Tenure legalization; (3) Incremental housing; (4) The construction of community facilities; (5) Upgrading open spaces; and (6) The enhancement of income-earning opportunities.

For Phase Two, the young architects decided to select, apply and contextualize the following theoretical and practical solutions: provision of community facilities, upgrading open spaces, and generating income-earning opportunities. The young architects considered workshops, kindergartens, maternal waiting facilities, and medical clinics as proposed community facilities. To upgrade the social life of the existing open spaces, the open market was also considered. The available vacant plots are reserved for practicing and promoting urban agriculture to generate additional income for slum dwellers with an agricultural backgrounds. Fresh products can be sold in the proposed open market.

For Phase Three, the young architects selected the following relevant case study precedents: (1) Case Study One: the young architect studied the Lycee Schorge Secondary School designed by Kere Architecture. The following design patterns were identified: (1) Using local materials; (2) Climatic responsive design; and (3) Connecting buildings with landscapes; (2) Case Study Two: the young architects studied Regional Market, designed by Mariam Kamara. The following design patterns were identified: (1) Designing an open market; (2) Providing semi-open spaces; (3) Facilitating a public space for social gatherings; and (4) Incorporating the existing gathering spaces within the design scheme. As part of the outcome of the ARC 403 course, the young architects presented the collected data in a thesis format.

The young architects focused on delivering the design proposal in the Graduation Project (ARC 402) design studio. For the first phase, the young architects adapted theoretical and practical solutions and selected design patterns considering the site and its context. The outcome of this phase is contextualized theoretical and practical solutions and contextualized design patterns. The final design proposal was actualized once contextualized theoretical and practical solutions and contextualized design patterns functioned appropriately and engaged with each other as a unified system. Once the entire project functioned accordingly, the final design project was delivered (see Figures 14–18).



Figure 14. As part of the design proposal the existing land was utilized for cultivating food [196].



Figure 15. Open market is proposed for selling fresh harvest [196].



Figure 16. The public facility of a maternal waiting home was proposed [196].



Figure 17. Public facilities, such as a medical clinic, can enhance the quality of life and well-being of the slum dwellers [196].

The provision of education and medical facilities might enhance the slum dwellers' access to education and medical services, although such claims require additional rigorous research to assess the project's positive and negative effects on slum dwellers' lives. The practice of urban agriculture might enhance the low-income slum dwellers' access to fresh food and generate additional income for them. The aforementioned practice might contribute to their well-being and quality of life.



Figure 18. Kindergarten as a public facility was proposed [196].

## 6. Research Findings

The possible positive aspects of the application of the proposed pedagogical framework within the architecture program is as follows: (1) The topic of slum upgrading can deliver valuable learning perspectives and insights for the young architects; (2) The young architects are granted the opportunity to conduct fieldwork in a real-life situation; (3) It encourages the young architects to engage in long conversations with the locals; (4) It is based on a systematic process that values research.

The possible negative aspects of the application of the proposed pedagogical framework within the architecture program is as follows: (1) For young architects with limited experience in conducting fieldworks, it is challenging to engage in fieldwork; (2) The young architect might face challenges regarding accessing the site or establishing contact with the gatekeepers; (3) The young architect might face difficulty in engaging with conversations with the locals; (4) Allocating sufficient time and budget for conducting fieldwork can be a challenge; (5) Establishing trust with the local community can be a challenge.

### *The Novelty of the Proposed Framework*

(1) It provides a specific framework for design projects, which is focused on the slum upgrading topic. The proposed framework values the slum dwellers' local knowledge and culture; (2) The proposed framework is based on an interdisciplinary approach to architecture and ethnography. It utilizes ethnographic tools for data collection during fieldwork on various occasions. The young architects learn to engage in data collection in real-life situations. In addition, the young architects are encouraged to apply problem-solving skills in specific case studies that struggle with real issues in particular local contexts. Such a process provides opportunities for young architects to leave the design studio and engage in specific case studies with real social, environmental and economic issues; (3) The young architects experience the research process and try to integrate it within the design process. The framework regards the research and design as interrelated. The young architects act as researchers/designers and experience the following process throughout the research/design process: (1) Acquiring knowledge; (2) Processing knowledge; and (3) Synthesizing knowledge. By engaging in research, the young architects develop proposals for existing problems; (4) The young architects build an inventory of data consisting of theoretical and practical solutions and selected successful case studies. The process of

inventory building is vital. The young architects experience adapting designated theoretical and practical solutions and a series of selected design patterns in the design project; (5) The young architects are empowered to be socially responsive. A design project, once built, has positive and negative outcomes. It can enhance the quality of life and well-being of people in a particular society and vice versa. The proposed framework is in conjunction with social sustainability. Social equity, quality of life, and well-being are three vital items within the social sustainability sphere. The framework aims to deliver design projects that can elevate the quality of life and well-being of slum dwellers and contribute to their social equity.

The recommended framework, which is established for the Graduation Project (ARC 402) studio, shares a similar approach to design with other conventional design studios as shown in the following points: (1) Both studios attempt to educate young architects to be creative and flexible problem-solvers; (2) Both studios regard design as a systematic process; (3) In both design studios, the young architects receive regular feedback; (4) Both design studios consider the site and its context during the design process.

## 7. Conclusions

As it is evident, population growth and urbanization are inevitable. Slum formation is a visible outcome of population growth, rapid urbanization, economic and political policy. Slums usually located at the periphery of major urban centers, house people who belong to the low-income segments of society. As is evident, slums will remain a critical issue in the upcoming decades. The discipline of architecture should consider the issue of slums in its curriculum, especially within the design studios. In fact, architecture curricula should be sensitive to social, economic, and environmental issues. The young graduates should be adequately equipped to meet the complex contemporary and future challenges, such as slum upgrading. The discipline of architecture can remain relevant to society by adopting its curriculum according to social and environmental issues and demands.

This research attempts to outline a pedagogical framework concerning architectural graduation projects, focusing on slum upgrades within the design studio. The fourth year curriculum is based on the following objectives: (1) A focus on a context-based design process by considering the local context, local people and their everyday demands; (2) A fourth year curriculum that is socially and culturally responsive, meaning that young architects should collaborate with local people during their design process and reflect their voices in their design projects.

The framework's novelty can be described as follows: (1) The recommended framework is specifically established for architecture design projects focusing on slum upgrading. The proposed framework is context-specific. It values the slum dwellers' local knowledge and culture; (2) The proposed framework is based on an interdisciplinary approach to architecture and ethnography. It encourages young architects to engage in fieldwork and utilize ethnographic tools for collecting data. It allows young architects to experience the process of data collection in real-life situations. The proposed framework values interacting with other disciplines to borrow methodological tools for data collection; (3) The young architects experience the process of research. The young architects as researchers/designers experience the following process throughout the research/design process: (1) Acquiring knowledge; (2) Processing knowledge; and (3) Synthesizing knowledge; (4) Each young architect must engage in research and build an inventory of collected data consisting of the following items: (1) Selected theoretical and practical solutions; and (2) Selected successful case studies. Such an inventory can assist the young architect during the design process as a reference point. Each young architect must adapt the selected theoretical and practical solutions and selected design patterns to the design project; (5) The proposed framework attempts to create awareness among young architects regarding social sustainability. The proposed framework values social equity, quality of life, and well-being as vital factors in the social sustainability discourse. The final design projects should be able to elevate the quality of life and well-being of the slum dwellers and contribute to their social equity. The

social sustainability vital factors can guide young architects to reach strategic decisions to achieve sustainable design solutions.

Currently, the discourse on sustainability is a key phenomenon in architecture. It is an urgent need to integrate sustainability in the design studios and design projects. Exploring and implementing new pedagogical methods in architecture design studios can provide a bridge between the discourse on sustainability and architectural design. In fact, architectural education must be restructured to respond to present-day complex environmental, social and economic issues [32]. The fourth year curriculum focuses on social sustainability. The principles of social equity, well-being and quality of life as part of the social sustainability discourse are highlighted within the design studio. Each design project should contribute to the well-being and quality of life of slum dwellers and enhance their social equity.

The architecture design studio is an ideal/unique environment for developing critical approaches to sustainability. Knowledge around sustainability can be introduced through regular lectures and one-to-one conversations between the young architects and the studio lecturers. Within the discipline of architecture, the discourse on sustainability can be valued when it is the focus of teaching and learning interactions within the architecture design studios [22].

In response to Research Question One—in which way can the fourth year curriculum be modified in order to be responsive to the slum upgrading topic?—the following points should be considered regarding the fourth year curriculum: (1) The academic staff responsible for the fourth year curriculum should engage in research and review the existing theoretical and practical solutions regarding the slum upgrading topic; (2) The academic staff should integrate the slum upgrading theoretical and practical solutions within the weekly lectures in the Graduation Research & Preparation (ARC 403) course; (3) Methodological tools for gathering data should be borrowed from other disciplines, such as ethnography, and reviewed during the weekly lectures in the Graduation Research & Preparation (ARC 403) course; (4) The young architects should be encouraged to consider context by visiting the site and conducting fieldwork. They should be encouraged to apply ethnographic tools for data collection during the fieldwork; (5) A participatory approach as a design approach should be utilized within the Graduation Research & Preparation (ARC 403) course and the Graduation Project (ARC 402) course in order to reflect the voice of the users within the design project; (6) Conducting research should be considered as a key factor within both aforementioned courses.

In response to Research Question Two—in which way can the fourth year curriculum be updated in order to be responsive to the principal social sustainability indicators such as social equity, well-being and quality of life?—the following points should be considered regarding the fourth year curriculum: (1) Design proposals and projects should be grounded in specific contexts; (2) The young architects should consider that their design projects are capable of positively or negatively impacting the quality of life and well-being of the local community and improve their equity. They should be mindful of the fact that architecture should not be regarded outside its context. Architecture is solely meaningful when it operates within a particular society; (3) Each design proposal and project should respond positively to the core indicators of social sustainability. Each design project and proposal should correlate with core indicators of social sustainability; (4) In order to establish the aforementioned correlation, the core indicators of social sustainability should be highlighted within the Graduation Studio (ARC 402) course.

#### *Further Research*

This research has significance for educators in the discipline of architecture. Educators in the design studio should consider how to restructure the design studio pedagogy to address the following points: (1) The young architects should be encouraged to engage in fieldwork and utilize various ethnographic tools for collecting data. Such an approach requires design studio pedagogy to follow an interdisciplinary approach in architecture and

ethnography; (2) The discourse on sustainability, particularly social sustainability, should be embedded within the design studio. Realizing this task requires commitment from the academic staff to prioritize the sustainability discourse within the design studio. Regular lectures and one-to-one interactions can elevate the knowledge base of young architects regarding sustainability issues; (3) Research should be integrated into the design process. By utilizing research, young architects can acquire, process and synthesize data.

The proposed framework presented in this study applies to a range of studio-based contexts. The recommended framework could be implemented in other architecture design studios to investigate its applicability and transferability further.

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