

Kingdom of Cambodia
Nation Religion King



Ministry of Education, Youth and Sport



Synopsis

This document provides a compendium of modern educational designs for multiple educational facilities within the USE-SDP 2 Project along with clear rationales of how and why they will facilitate improved learning.

NEW EDUCATION DESIGN FRAMEWORK:

Creating Modern Learning
Environments for Cambodian
Secondary Schools

This publication was developed by MoEYS' *Upper Secondary Education – Sector Development Project (USE-SDP2)* and in cooperation with Kampuchea Action to Promote Education in order to document recent innovations in educational design and environment.

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ABBREVIATIONS

ADB	Asian Development Bank
CFS	Child Friendly Schools
CGC	Career Guidance Counseling
CPD	Continuous Professional Development
ESDP III	Educational Sector Development Program III
ESP	Education Strategic Plan
HS	High School
IbL	Inquiry-based Learning
ICT	Information & Communication Technology
KAPE	Kampuchea Action to Promote Education
MoEYS	Ministry of Education, Youth, and Sport
NGS	New Generation School
NIE	National Institute of Education
NSDP	National Strategic Development Plan
PbL	Problem-based Learning
PCR	Pupil Class Ratio
PLC	Professional Learning Community
PW	Project Work
SRS	Secondary Resource Schools
SS	Secondary Schools
STEM	Science, Technology, Engineering, & Mathematics
USE-SDP2	Upper Secondary Education – Sector Development Program 2

FOREWORD

The present document was developed by the Ministry of Education, Youth, and Sport (MoEYS) to facilitate the introduction of new educational designs in secondary schools as part of the process of educational reform. The framework described in this document includes recommendations for new designs based on the latest educational architectural trends in other countries as well as in-country experience from other successful programs that focus on educational innovation such as MoEYS' New Generation School Initiative. The framework proposes new configurations for multiple educational facilities including classrooms, libraries, science labs, and life skills classrooms. These furniture configurations depart from traditional forms commonly used in Cambodian classrooms in order to promote new target methodologies that are being promoted under MoEYS' educational reform program such as Problem-based Learning (PbL), Project Work (PW), and Inquiry-based Learning (IbL). Changing the physical configuration of educational facilities in this way is based on the premise that architectural and furniture designs can have a major influence on how children learn and how teachers teach. Indeed, there has been considerable empirical research that shows that educational designs can have a major impact on learning. Thus, the hope of the Ministry is that the current educational design framework can positively influence the quality of instruction in all public schools.

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1. INTRODUCTION

1.1 Background

This educational design framework was developed to provide an overview of the physical upgrading suggestions for schools that are being assisted under the *Upper Secondary Education – Sector Development Program 2 (USE-SDP 2)*. This initiative is focused on improving the access, quality and relevance of upper secondary education (USE) and strengthening the institutional capacity for planning, management and service delivery of the Ministry of Education, Youth and Sport (MoEYS). It is an extension of the ADB financed Third Education Sector Project (ESDP III), which was designed and implemented to improve the equity, quality and efficiency of education services of the Lower Secondary Education (LSE) sector in Cambodia. USE-SDP 2 is funded through ADB Loan 3427-CAM (COL) amounting to \$30 million, supplemented by Government’s contribution in kind to the tune of \$3 million. The project aims to support the implementation of key priorities of MoEYS’ *Education Strategic Plan (ESP) 2014-2018*, in compliance with the *National Strategic Development Plan (NSDP) 2014-2018*, with emphasis on improving access to and the quality and relevance of Upper Secondary Education.

One of the elements of upgrading a public school into a more modern facility involves physical improvements to better address the needs for 21st Century Education. This includes the need for modernized library facilities, science labs, meeting facilities conducive to professional learning communities, life skills facilities, and modern classrooms. As a first step to carrying out these physical upgrading efforts, MoEYS engaged a national development partner known as Kampuchea Action to Promote Education (KAPE), to help develop a framework document that provides recommendations for change in both architectural design and furniture configuration in educational facilities targeted by the USE-SDP 2 Project. KAPE was selected by MoEYS to help in drafting these recommendations because of its successful experience in revolutionizing educational design in the New Generation School system, which is an important educational reform introduced by MoEYS in 2015. This experience provides concrete lessons learned that may prove useful to USE-SDP 2.



A Resource Center Facility at a school supported by USE-SDP2.

The recommendations drafted in this framework document include floorplans, idealized representations of how re-designed educational facilities would look, narrative descriptions that explain how new configurations can promote learning for the 21st Century, and cost estimates to facilitate project procurements that would help realize

recommendations. The presentation of these recommendations forms the primary purpose of this document.

1.2 Educational Context

Altogether, USE-SDP 2 will be supporting 50 Secondary Resource Schools (SRS) as well as 87 network schools, which receive technical assistance from the SRS's in their area. The Resource Centers at SRS's are specialized facilities that include libraries, ICT and science labs, and meeting rooms. A number of these facilities are currently under construction and will join 37 Resource Center buildings previously built. All Centers will be considered for additional investments to improve their physical designs while new Resource Centers will profit from some of the design lessons learned earlier. The network schools do not possess Resource Centers but will be receiving investment from the project to improve libraries, life skills activities, and other educational facilities. The 137 schools supported by USE-SDP 2 are spread throughout all provinces in Cambodia and will all benefit from investments in infrastructure and modernization of school facilities.

1.3 Organization of the Framework

The organization of this framework document begins with a section that provides some empirical evidence about how educational design can affect educational practice. In this respect, recent studies have shown that students' academic performance can be enhanced in schools with better physical learning environments, which promote different kinds of learning (e.g., group learning, team work, etc.). New pedagogies promoted in USE-SDP 2 (e.g., Inquiry-based Learning, Problem-based learning, etc.) are intended to help the learning process move beyond passive learning that usually results from lecturing, which is still a common method of teaching in Cambodia. New educational designs can help to facilitate the implementation of some of these new pedagogies targeted by the project. This section also discusses some basic principles of educational design that can be useful in the Cambodian context.

After discussing the theoretical framework that supports changes in educational design, the document then moves on to specific suggestions for various educational facilities that will be re-designed in USE-SDP 2 Schools. This includes:

1. Modern Libraries, sometimes known as 21st Century Libraries
2. Color-coded Classrooms
3. Science Labs
4. Multi-purpose Life Skills Classrooms

The suggestions made for each facility in this regard include an explanation for how changed educational designs can enhance the use for which a facility is intended. This may include making libraries more efficient in terms of the services that they can provide (e.g., book access, m-learning services, online research, etc.); promoting different kinds of learning in classrooms (e.g., presentations, group work, etc.); facilitating hands-on science in science labs, etc. Each facility subsection provides floorplans and idealized furniture layouts to make these discussions as concrete as possible. Each section also includes a list of necessary furniture and equipment and estimated costings for each suggested furniture configuration to facilitate procurement.

This framework document also includes a set of **Annexes** that provide more detailed specifications for custom-made furniture along with dimensions, functional explanations, and nominal costs. Each annex is organized by the educational facility to which it pertains.

Annex 1 is particularly important as it provides aggregate costings for procurement associated with each educational facility. These annexes will play an important role in helping procurement officers to modulate procurements to fit within the available budgets of the project.



Figure 1.1: The copious availability of bulletin boards can promote the ability of students to do project work whereby they develop presentations as groups and display them for the whole class to see.

2. GENERAL PRINCIPLES OF EDUCATIONAL DESIGN

2.1 How Building Designs Can Influence Educational Practice

The linkages between building design and educational practice are often very subtle. Many observers barely notice how the design of a classroom building can influence the behavior of both teachers and students. For example, traditional Cambodian classrooms usually have a platform at the front where the teacher usually sits and/or lectures. This design feature suggests the centrality of the teacher in the learning process and promotes



Figure 2.1 -Traditional Design: A renovated classroom using traditional design features such as a raised platform at the front of the classroom emphasizes the ascendant position of the teacher. This is a good example of how classroom design can indirectly affect pedagogy.



Figure 2.2: Classroom Design that Drives New Pedagogies: Semi-circular desk forms facilitate a roundtable discussion.

lecture-style pedagogy. It is often ironic that many projects seeking to foster student-centered learning are also funding the construction of new educational facilities with this old-style design feature. Thus, the building designs that they promote are often inimical to the methodologies that they are also advocating for.

The formulation of building designs should consider the different ways that students learn most effectively. This may include individualized study, group learning, large

lecture style settings, access to the internet, and other modalities. The way that classrooms and study areas (for example in the library) are laid out can have a major impact on promoting or inhibiting these modes of study. This observation often implies the need for desks that can be easily moved and joined together in different shapes (e.g., hexagonal or semi-circular shapes). Such specifications contrast with the long, heavy wooden desks that are commonly used in Cambodian classrooms.

Similarly, design considerations

proximity to such facilities as ICT labs, Offices, and or Faculty Rooms to maximize coordination with educators who run these other facilities. Organizing space in the school in this way reflects the idea of building the school ‘from the inside out’ so that each space supports the needs of learners in classrooms (see Box 1 below).

2.2 What the Research Literature Indicates about School Design

The impact of educational design on children’s learning has been an area of growing interest among many educators. A recent publication by the World Bank found that improvements in educational facilities accounts for about 16% of the variance in children’s learning, which highlights the need for infrastructure upgrading programs to get their inputs ‘right.’¹ Some of the factors most commonly associated with improved learning impacts are summarized in Box 1. It is important to remember, however, that design features by themselves cannot promote improved learning but that they can facilitate such improvements when those managing educational spaces effectively interact with them. Thus, improved educational design is a ‘necessary’ condition for improved learning but it is not ‘sufficient’ in and of itself. This suggests the need to orient teachers to new educational designs so that they know how to use them to maximum effect. In addition, those individuals responsible for training teachers in USE-SDP schools in new pedagogies should be sure to link their training content with some of the new design features that are discussed in this framework document.

MoEYS has also generated a considerable amount of empirical experience in educational design through the implementation of its New Generation School reforms.² NGS programmers have done extensive reviews of new educational design in other countries and have sought to contextualize some of these designs to the Cambodian context. Programmatic consultations on new school designs have considered the need for (i) multi-functional uses of furniture and space; (ii) the use of materials and layouts that are sustainable and eco-friendly; (iii) designs that promote the instruction of STEM subjects and the use of technology; and (iv) the need to balance all of these considerations with a concern for aesthetic appearance. These considerations have not always been easy when budgetary constraints have often been a serious concern. But in general, NGS programmers have found that new educational design is not necessarily more expensive than traditional

Box 1: Design Factors that Positively Contribute to Student Learning

- Good “natural” conditions such as lighting, air quality, temperature control, acoustics, and links to nature.
- Age-appropriate learning spaces that offer flexible learning opportunities that pupils can adapt and personalize.
- Connections between learning spaces that are easy to navigate and that may provide additional learning opportunities.
- A level of ambient stimulation using color and visual complexity.
- Schools that are designed from the inside out (classroom to school) so that each space meets the needs of its inhabitants.
- Designs that take into account local climatic and cultural conditions.

Source: World Bank, 2019

¹ Barret, P., Treves, A., Schmis, T., Ambasz, D., and Ustinova, M. (2019) *The Impact of School Infrastructure on Learning: A Synthesis of the Evidence*, Washington, DC: World Bank.

² MoEYS (2020) *School Architecture for a New Century: New Generation School Designs & Guidelines for Aesthetic Infrastructure Investment*, Phnom Penh: Author.

design; indeed, in some cases such design is actually cheaper. Thus, it is believed that the educational designs suggested in this framework document should fall within the budgetary resources available to the project.

The new architecture publication printed by MoEYS provides numerous guidelines for the configuration of learning spaces using modern principles of school architecture while also providing numerous case studies in Cambodia, sample building layouts, price estimates for procurement purposes, and recommendations for future directions in school design in the Kingdom. The publication notes that modern design is in many cases no more expensive than traditional design and occasionally it is actually cheaper.

Based on the available literature, the present framework puts forward a number of design guidelines that should be useful for USE-SDP 2 planners when upgrading educational facilities in target schools. Proposed guidelines are intended to ensure that infrastructure upgrading activities promote other planned investments in teacher capacity (e.g., accommodative of new pedagogies), the more intensive use of technology in learning (e.g., technology-friendly) while also being economical in terms of their costs. These guidelines are described in Box 2.

Box 2: Suggested Guidelines for Upgrading Facilities in USE-SDP 2 Schools

- **Multi-functionality:** Develop furniture designs that are multi-functional in nature. Possible functions include storage, seating, display, etc.
- **Accommodative of New Pedagogies:** Furniture configurations should be accommodative of new pedagogies such as IbL, PbL, etc. This might include the use of light-weight desks and furniture designs that accommodate group discussions.
- **Technology-friendly:** The design of learning spaces should be accommodative of technology including the availability of outlets, storage of mobile devices, internet availability, and other features.
- **Use of Colors:** Introduce colors to increase the attractiveness of learning spaces as well as indicate their function (e.g., color-coded classrooms).
- **Space Efficient:** Use custom-made furniture to ensure that furniture fits exactly into the spaces available so that the limited space in schools is used efficiently.
- **Aesthetic Attractiveness:** Consider using design philosophies such as minimalism that ensure harmony of colors, materials, and furniture organization.



Figure 2.3 - Multi-Functional Furniture: An innovatively designed bookcase that integrates both bookshelves and seating into a single furniture unit provides a good example of multi-functionality.

3. SPECIFIC FACILITIES

3.1 Twenty-first Century Libraries

General Overview: The 21st Century Library is often considered the ‘heart’ of a modern school. Its design should provide specialized areas for private reading, audio-visual presentations, and research on two to four computer stations, depending on the size of the school. If possible, a circulation desk should be positioned in a way to give a wide view of the library to ensure easy monitoring, order, and continuous oversight. The central area of the room may be carpeted to enable students to sit comfortably on the floor to enhance the idea of ‘maker’ spaces while a runner of parquet or tile flooring around the perimeter helps to limit ambulatory activity to a prescribed area and prevent wear and tear on the carpet.

The Need for Multiple Library Designs: The present framework provides for three library designs depending on the size and number of rooms available for library facilities. Some schools have only one standard classroom available while others possess two rooms. Resource Center schools have a single room that is generally larger than a standard classroom while Network Schools have either a single or double room depending on the availability of classroom space. Room availability and corresponding dimensions are explained in Box 3.

Box 3: Library Facility Dimensions

Secondary Resource Schools

- **Resource Center Library:** 6.8 M x 11.8 M
See Figure 3.1 for Floor Plan

Network Schools

- **One-Room Library:** 8.2 M x 7.2 M
See Figure 3.3 for Floor Plan
- **Two-Room Library:** 16.3 M x 7.2 M
See Figure 3.5 for Floor Plan

Furniture Configurations: Re-designed libraries in USE-SDP 2 schools will be equipped with enough built-in cabinets to house over 10,000 books. Custom-made furniture designs in renovated libraries make provisions for research stations, an audio-visual theatre, a circulation desk, and small niches for individualized self-study and ‘maker spaces’ (for group project work). Custom-made furniture allows the configuration of the library to follow the contours of existing buildings; for example, supporting pillars in the middle of a room can be used to accommodate specialized bookcases while wall-to-wall cabinet emplacements allow optimum utilization of wall space to store books. Color tones may vary in proposed library facilities. Wood tones may be used to give a uniform and warm ambience for readers (as can be seen in Figures 3.2, 3.4, and 3.6) but primary colors may also be used (e.g., red) against a white background. The identification of color schemes in a library should be discussed with local stakeholders so that they can feel some ownership of the library. To be sure, one should present enough examples of harmonious color schemes so that color selections are consistent with design principles expounded in this framework.

The modern library designs proposed for USE-SDP 2 schools provide specialized areas for private reading, audio-visual presentations (e.g., Mini-theatre) and research (e.g., Research Stations) on two to four computer stations. The circulation desk is usually positioned in a way to give a wide view of the library to ensure order and oversight. The central area of the room may be carpeted to enable students to sit comfortably on the floor to enhance the idea of ‘maker’ spaces while a runner of tile or parquet flooring around the perimeter will help to limit ambulatory activity to a prescribed area and prevent wear and tear on the carpet. Idealized versions of furniture configurations are provided in Figures 3.1 to 3.6 to convey some idea of how floorplans will look in real life (see below).

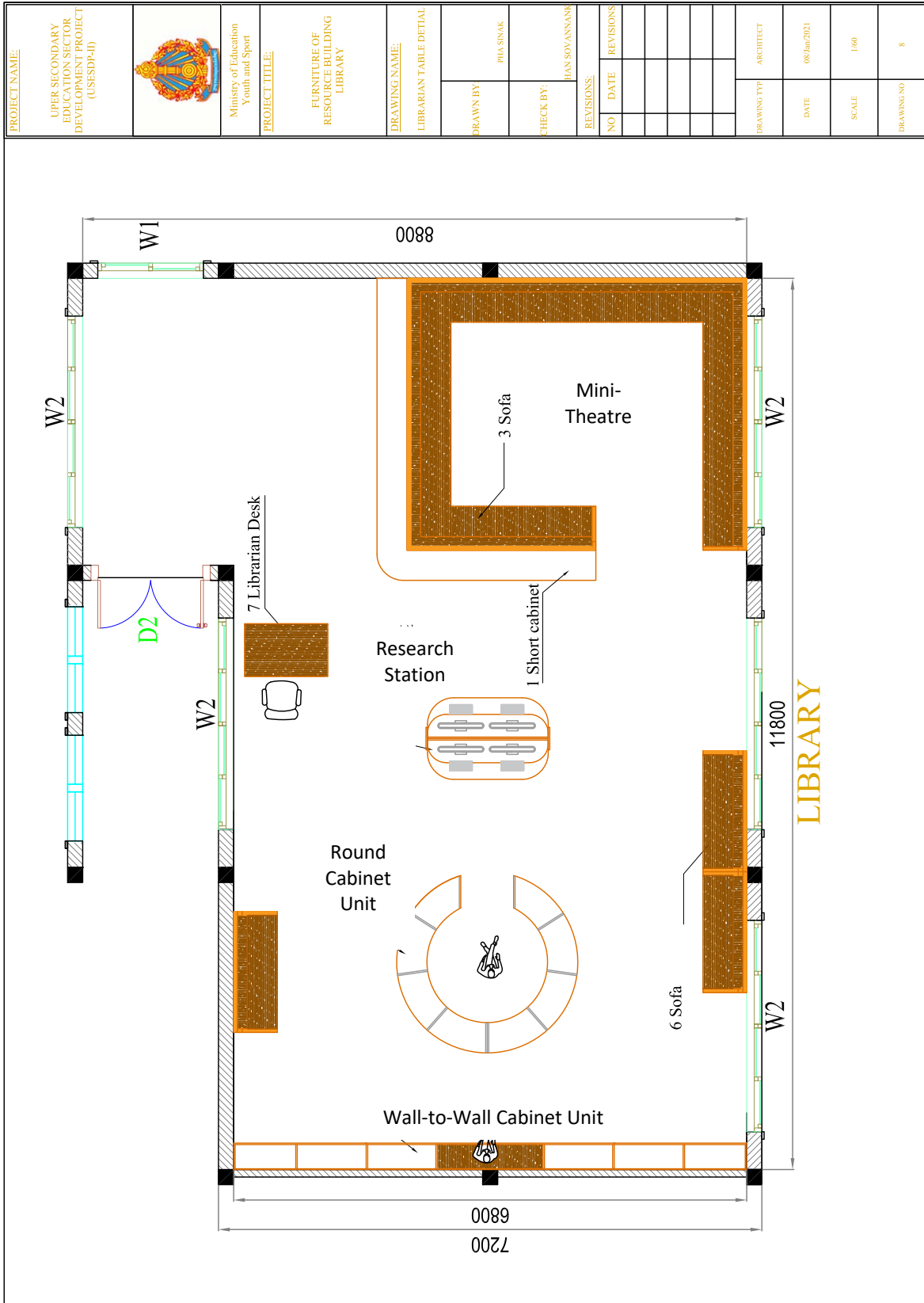


Figure 3.1 - SRS Library Floorplan: Proposed Floorplan for a Secondary Resource School Library is shown above. This facility has copious book storage and comfortable seating for readers, a Research Station with 4 workstations, and a Mini-theatre that can accommodate a 55" Television Screen. The Library can accommodate approximately 40 to 50 students at any given time.



Figure 3.2A



Figure 3.2B

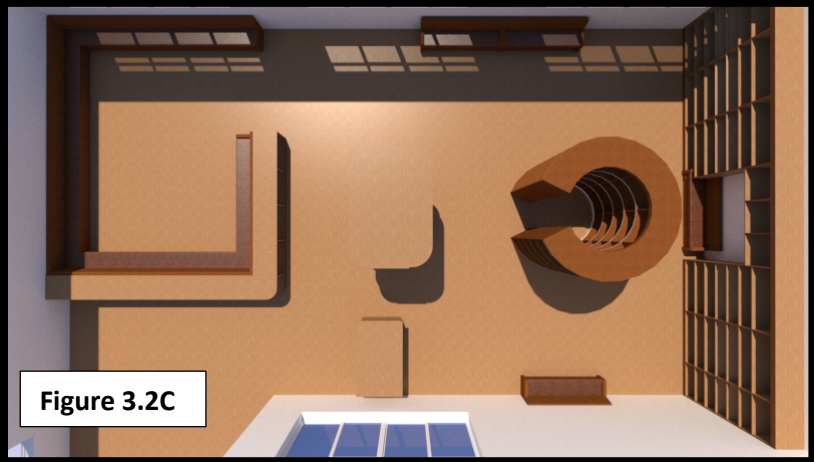


Figure 3.2C

Figure 3.2A: Long view of SRS Library showing the Mini-theatre in foreground & Research Station in the middle.
Figure 3.2B: Diagonal view of SRS Library showing cubby holes for student storage that are built into seating for the Mini-theatre, showing a multi-functional use of furniture.
Figure 3.2C: Top view of SRS Library.

Figure 3.3 – Network School Library (1-room): The floorplan below shows the layout of furniture in a one-room Network School Library. The floorplan shows a wall-to-wall book unit at the bottom, a round book unit at the center that can hold over 5,000 books, a Research Station with two workstations, and a Mini-theatre in the upper right-hand corner. Rectangular boxes along the perimeter of the library indicate seating areas.

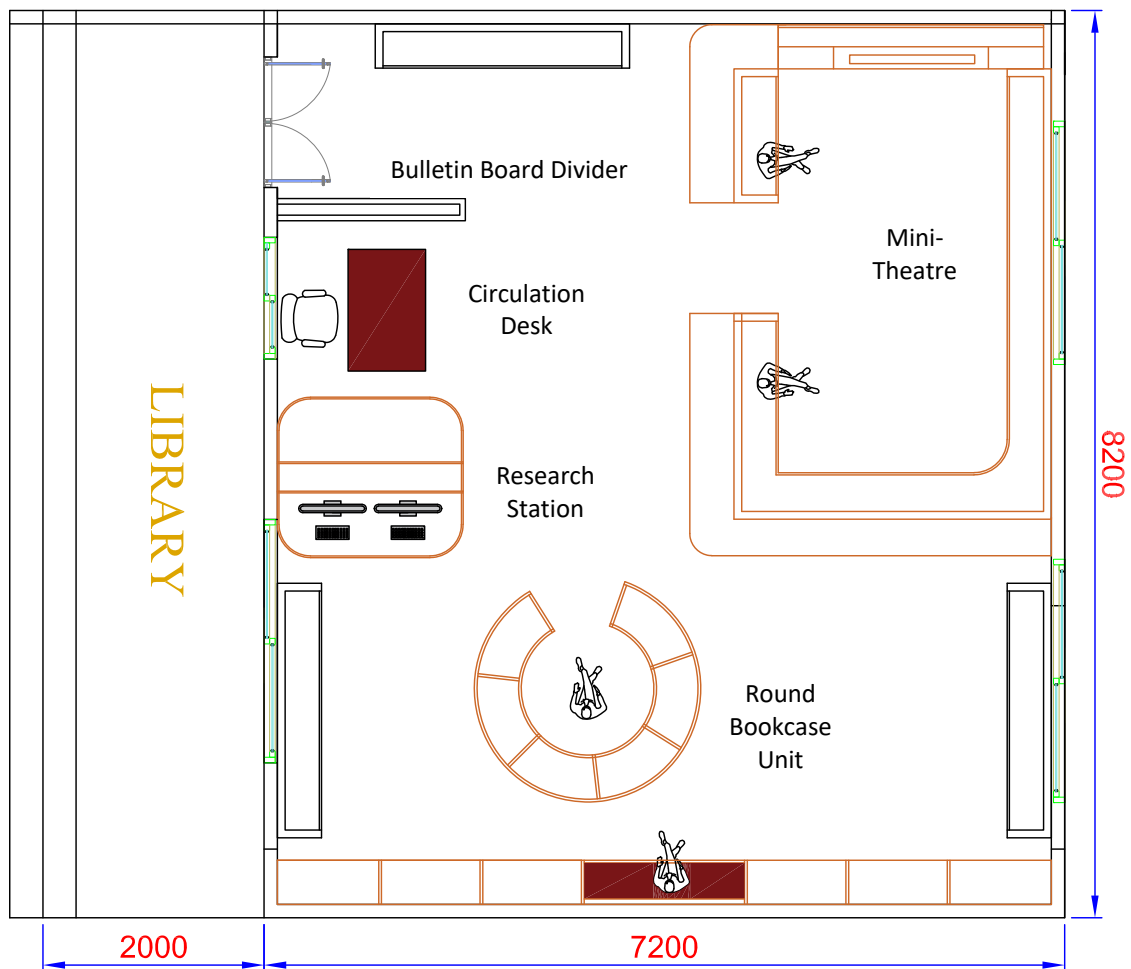


Figure 3.4 – Idealized View: The picture above shows an idealized view of a one-room library at a Network School with efficient book storage units at the left and a Mini-Theatre at the right with seating on the inside and cubby holes for student storage on the outside. The entrance to the library in the background shows a bulletin board on one side and a colorful wall mural on the other to greet students as they enter the library.

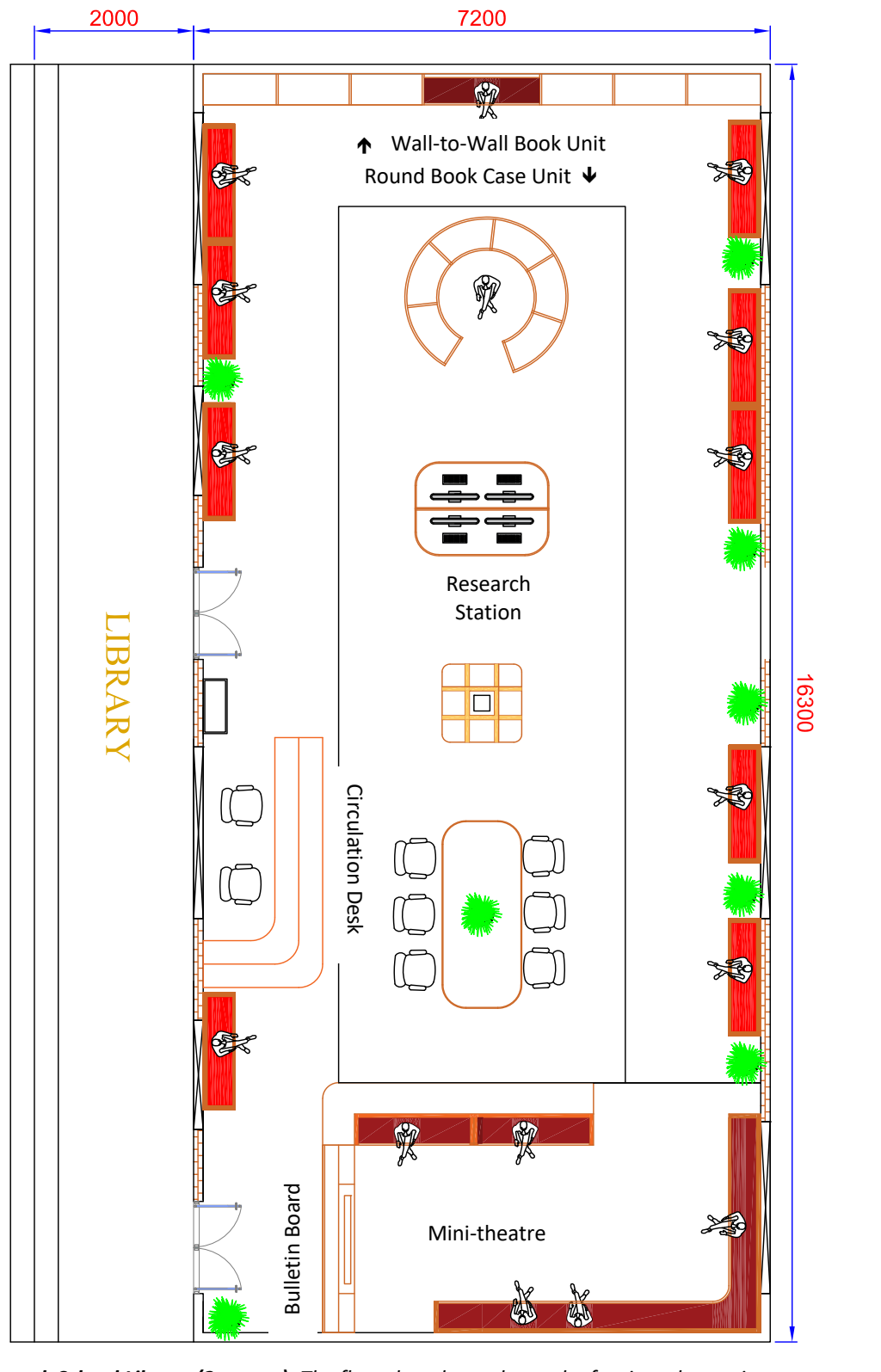


Figure 3.5 – Network School Library (2-rooms): The floorplan above shows the furniture layout in a two-room library in a Network School. The library has two entrances that are flanked by the circulation desk. The entrance on one end displays a bulletin board on the other side of a cabinet that houses the Mini-theatre television screen showing a multi-functional use of furniture. A pillar in the middle of the room is sided with a book case. At the far end of the library there is a Research Station, as well as a round bookcase, and a wall-to-wall book unit that can store up to 10,000 books. Red boxes along the perimeter of the library indicate built-in seating to accommodate individual readers.

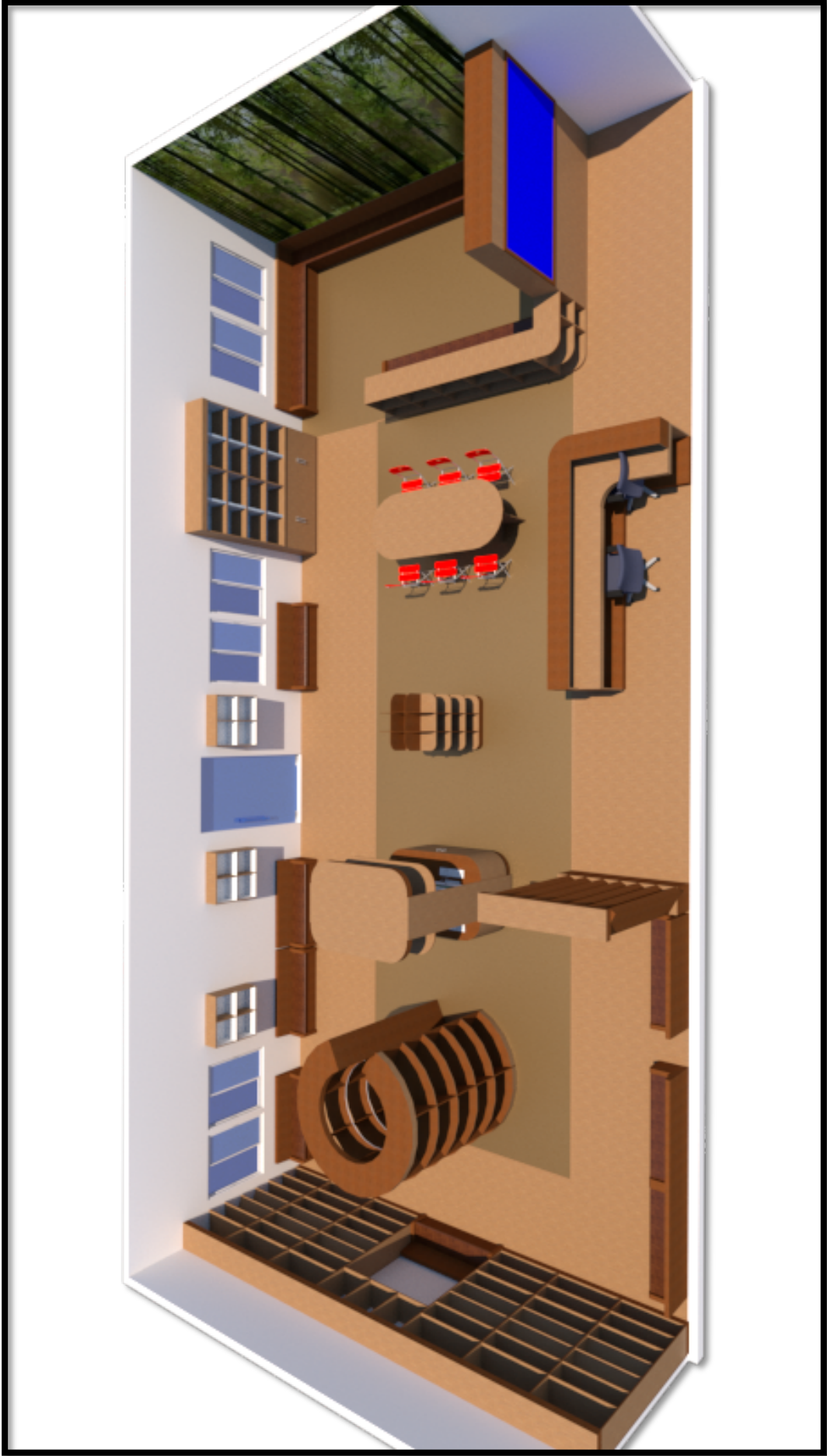


Figure 3.6 – Idealized View: This idealized representation shows a modern library set in a two-room facility in a Network School. The layout of the library is quite spacious and has many spaces where students can work in groups (e.g., writing table, Mini-Theatre, etc.) or read individually. This library includes a research station that can hold four work stations numerous book units that can hold up to 10,000 books. There is also copious seating along the perimeter of the library that can sit up to 60 or 70 students.

3.2 Color-coded Classrooms

General: The educational designs for classrooms suggested in USE-SDP 2 target schools are different from what students might encounter in a science lab (see next section). In this respect, we refer to such facilities as Non-Science Classrooms that might be used for Khmer Language, Mathematics, the Social Sciences, or Foreign Languages. It is recommended that the color scheme of non-science classrooms be varied from classroom to classroom by color coding each subject (e.g., blue for social science, red for Khmer, etc.) Color coding classrooms in this way will afford some variety to learning settings. When students encounter different physical settings during the day, it will help to avoid the monotony of traditional classroom designs that often lead to boredom and disinterest.

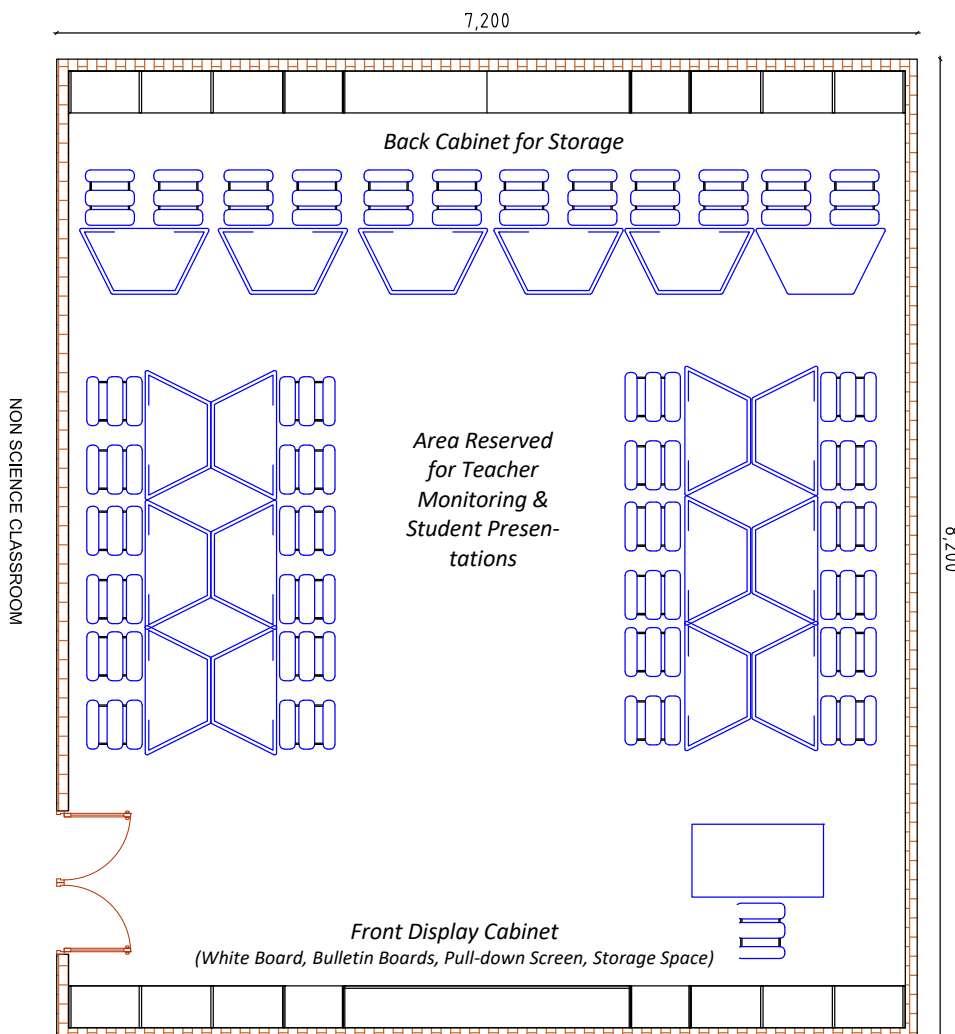


Figure 3.7 – Floorplan for a Color-Coded Classroom: The figure to the left illustrates the floorplan of a Non-Science Classroom that uses hexagonal-shaped desks to seat students. These desks can be configured in many different ways to facilitate student group discussions and project work. The space in the middle of the classroom is reserved for student presentations or teacher monitoring behaviors. Wall-to-wall cabinet units at the front and back of the classroom also provide multi-functional facilities for storage, white-board display, and bulletin boards for student projects.

Furniture Configuration: It is further suggested that subject classrooms in USE-SDP 2 target schools used for Mathematics, Khmer Language, English, History-Geography, and Morals are furnished with 18 desks with specialized shapes (see Figure 3.8 below) that can each seat two students. This enables up to 36 students per classroom, which is the maximum number of students suggested for a classroom; fewer students are recommended when possible.

Education designers have also suggested the use of alternative student desk shapes for classrooms in USE-SDP supported schools (see Figure 3.8). The newly shaped desks are intended to allow many different student grouping configurations. For example, desks

may be hexagonally-shaped or semi-circular so that they can be placed together to form a larger symmetrical unit. Once again, a U-shaped configuration of desks is often suggested to free up space in the middle of the classroom to facilitate easy movement of the teacher around the classroom as well as student presentations and group activities (see Figures 3.7 and 3.9).

Multi-functional cabinets are also proposed at the front (bulletin boards and white board) and back (for storage of educational supplies) of the classroom, as is also the case for science labs. These cabinet units are wall-to-wall in design, multi-functional, and highly efficient in the way that they use space (see Figures 3.10A and B). The color of the cabinets should employ the same color as student desks to provide a harmonious display of color.

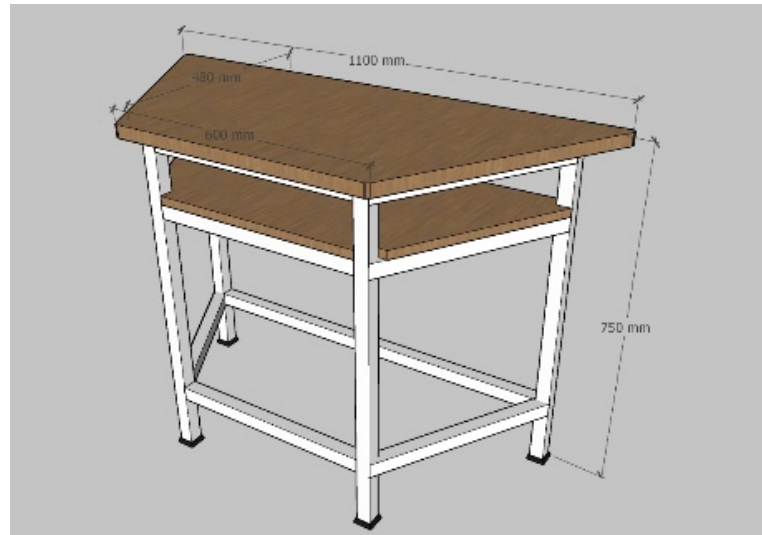


Figure 3.8: The hexagonally-shaped desk shown above can sit two students and facilitates the grouping of desks into multiple combinations that may create groups of 4, 6, or 8 students.

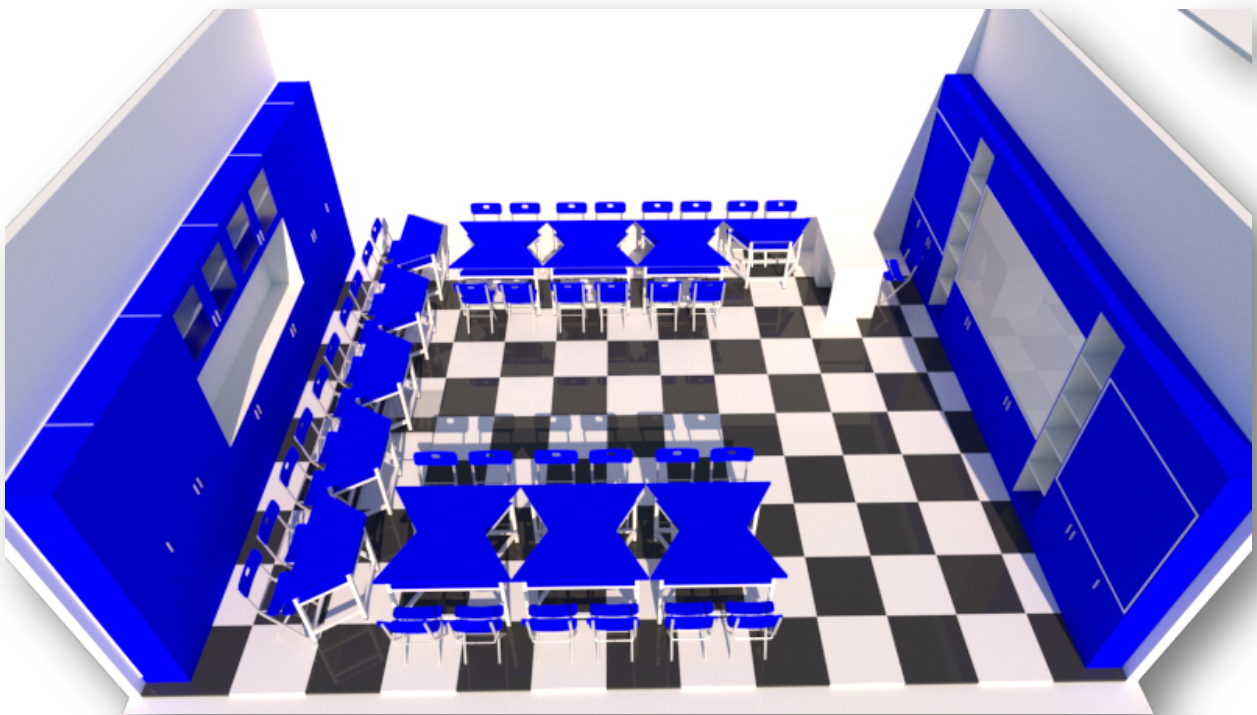


Figure 3.9 – Idealized View of a Color-Coded Classroom: The color-coded classroom layout shown above demonstrates how some simple changes in classroom design can achieve major improvements in the learning environment. The new shape of student desks increases the number of possible variations in student groupings while the space created in the middle of the classroom enhances the ability of the teacher to move about between student groups. Bulletin boards at the front of the classroom provide a ready-made space for student exhibitions while the cabinets at the back provide copious storage for all the teaching aids a teacher might need. Finally, the monochromatic color scheme brings harmony to the classroom and adds to the aesthetic appeal of the learning environment.

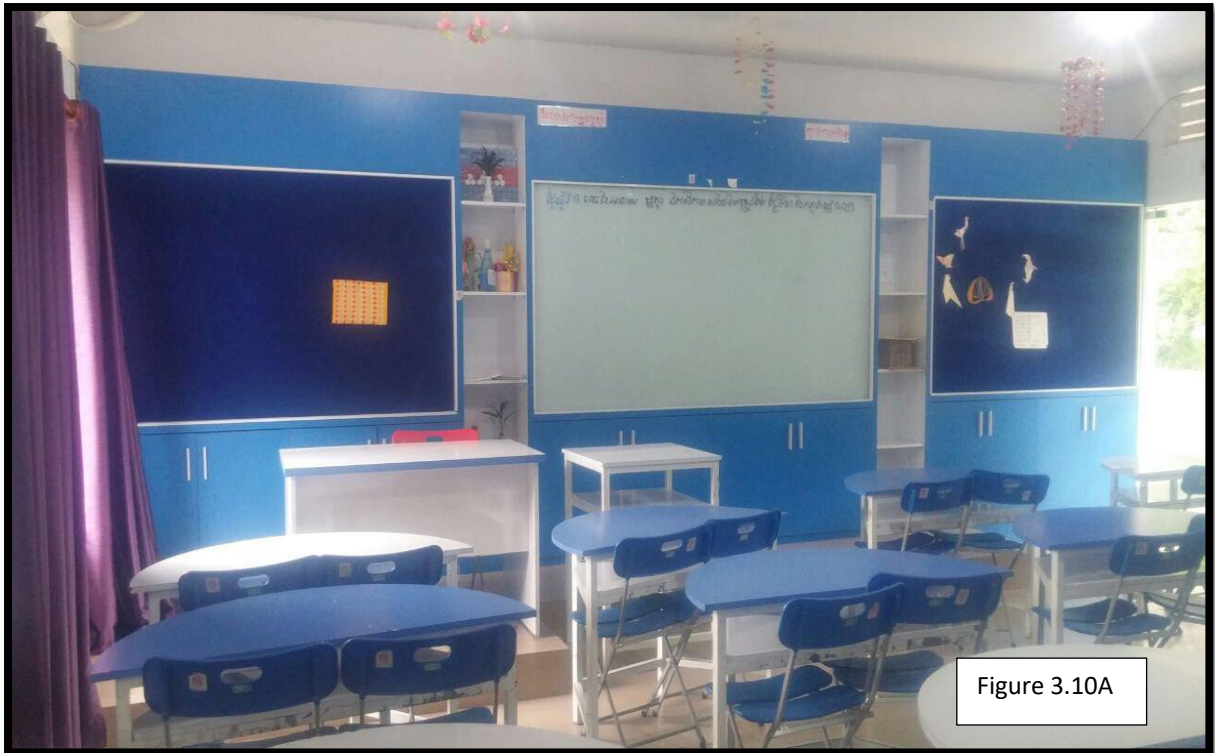


Figure 3.10A



Figure 3.10B

Figures 3.10A & 3.10B – Non-science Classroom Cabinet Units: Wall-to-Wall Cabinet Units at the front (Figure 3.10A) and back (Figure 3.10B) of a Non-science Classroom demonstrate how new furniture designs can efficiently use space for multiple purposes. The front cabinet unit provides two built-in bulletin boards that can be used for student projects as well as a large whiteboard and cabinet space at the bottom for the storage of stationery. The cabinet unit at the back provides even more storage space for heavy equipment, posters, books, etc. as well as a space in the middle that can also be used to house student projects or special educational displays. Both units are made of heavy gauge formica sheeting to withstand heavy wear-and-tear. The cabinets may use variable colors to harmonize with the color of desks and chairs.

Concluding Remarks: The transition from traditional classroom configurations to new ones has not always been easy and there has been much resistance from more conservative educators along the way. Nevertheless, the high potential of the new designs to promote more child-centered learning along with a renewed focus of aesthetically attractive learning environments can help to create a constituency of support among many teachers.



Figure 3.11 – Transformative Changes in the Learning Environment: The introduction of light-weight student desks with unique geometric shapes that facilitate student group work can have a transformative effect on the learning environment in USE-SDP 2 Schools. The above photograph demonstrates how innovative furniture configurations can drive the implementation of new pedagogies targeted by the project. Color coding the desks and harmonizing the color scheme with other furniture in the room can further amplify the aesthetic appeal of the learning environment.

3.3 Science Labs

General Overview: The Science Labs in USE-SDP 2 target schools have been designed to afford the creation of 6 work stations that can each accommodate six students (see Figure 3.12). This layout accords with Cooperative Learning principles in which the optimal size for a group is 4 to 6 students. Two science workstations share a sink between them requiring the emplacement of 3 sinks plus one for the teacher at the head of the classroom. Creating groupings of students in this way very much helps to facilitate hands-on science activities, as part of the effort to enhance STEM instruction. The labs are also equipped with a built-in cabinet at the front of the classroom and one wall-to-wall unit at the back of the classroom, which is designed to hold a large amount of science equipment. Keeping materials in the classroom provides greater assurance that teachers may use them in their teaching rather than expecting them to carry science equipment and supplies with them from a central storage location.

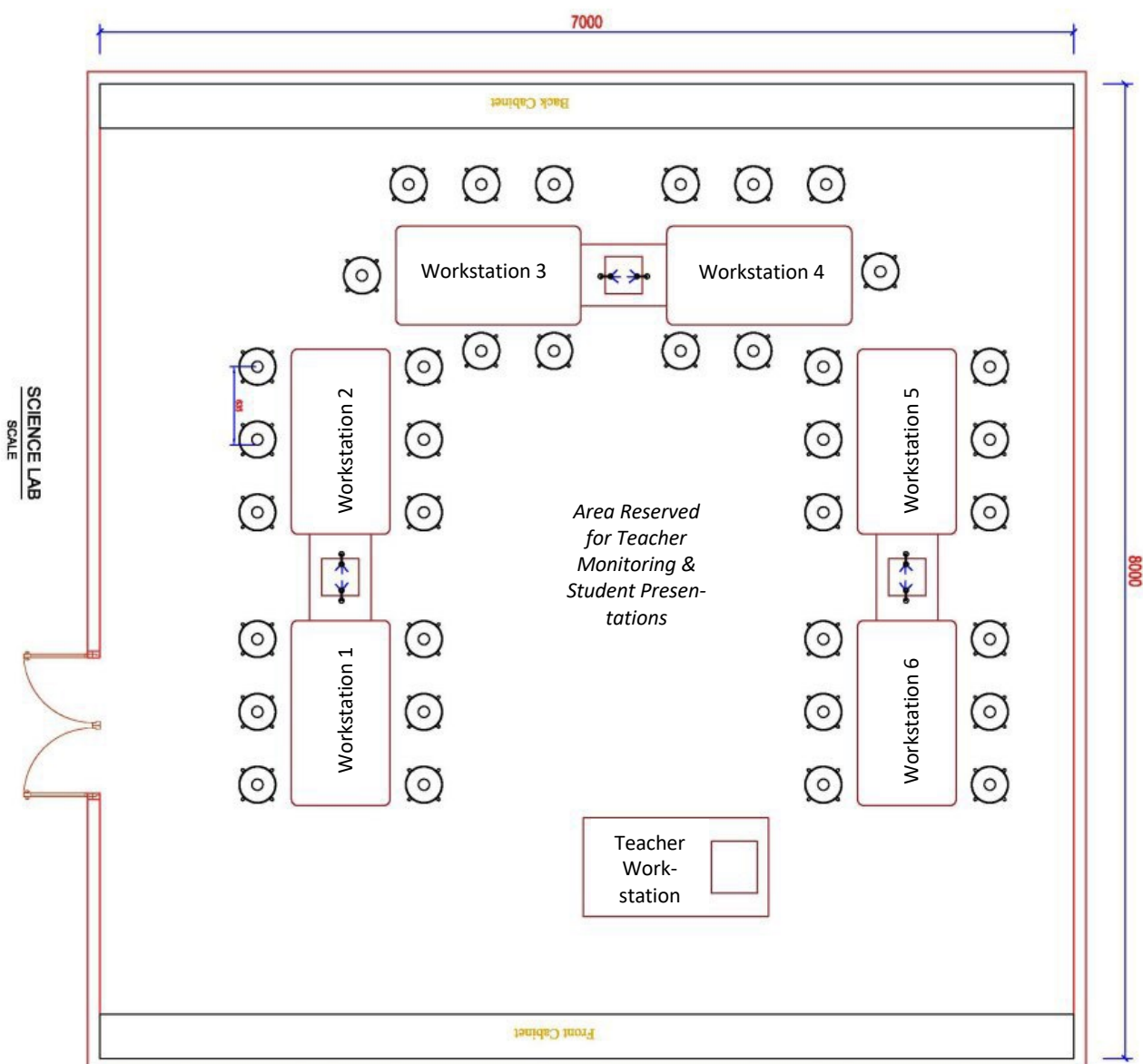


Figure 3.12 – Floorplan for a New Kind of Science Lab: The floorplan above introduces the idea of island workstations in which three groupings of linked work tables can accommodate 6 student groups each engaged in hands-on science education. A teacher desk at the front of the room with its own sink enables teachers to do presentations on experimentation that students can then replicate in their own groups.

Island Workstations: The clearly designated work stations described above are covered with a marble top to facilitate experiments that may involve the use of chemicals. The workstations are configured in a U-shape to facilitate easy monitoring and group presentations. The table workstations are comprised of movable units so that their configuration can be changed to meet the changing needs of teachers. Although the sink stations are, of course, fixed due to the plumbing fixtures that they conceal, this movable design of furniture provides an additional degree of flexibility that is an improvement over fixed workstations that were a characteristic of earlier designed science labs. A dark wood tone has been used to ensure appropriate color coordination with workstations that have black marble tops.



Figure 3.13 – Island Workstation: The proposed Island Workstation in a science lab sits two groups of 6 students on either side of a sink with two faucets that can be used in common. The sink stand also includes a cabinet at its back that can be used for storage. This work station is designed for use with short stools made of chrome or wood. Work stations are made of heavy pressed wood frames and with Mahogany color formica veneer. Work station tops are made of black marble with high gloss to resist any chemical spills. Sinks may be made of high-quality stainless steel or ceramic. Stools are made of high gloss chrome with hard rubber leg caps to prevent rubber marks on the floor.



Figure 3.14 – Sink Stations Used in Common: The common sink station with two faucets helps to reduce the cost of science lab emplacement by providing one centrally located sink that can serve two groups of six students at the same time. The sink itself should be made of high-grade steel to prevent rust or scratch-resistant ceramic. The station itself has a marble top to prevent water seepage into the water resistant formica frame below. Because of the plumbing outlets in the floor below to which the sink is connected, the sink stations are not intended to be movable. For this reason, procurement teams may consider using either a formica wooden frame for the station (as shown in the picture to the right), which is the cheapest option, or a cement casing lined with a formica veneer of the same color. The latter option is more expensive but ensures an added degree of water damage prevention due to possible water seepage from the sink above.



Figure 3.15 – Proposed Layout for a Modern Science Lab - The picture above is an illustration of a modern science lab design that uses a monochromatic color scheme and design configuration that facilitates 21st Century skills such as team work, experimentation, and presentation. The shared use of sinks in each group also enables an economical use of resources, yielding 6 workstations but only 3 sinks. The free space in the middle of the lab enables the teacher to move around the classroom freely, playing the role of facilitator rather than controller. This classroom design demonstrates well the interdependence of pedagogical methods and the physical layout of a lab.

Furniture Configurations that Promote Hands on Science: The operationalized examples of science learning shown Figure 3.16 demonstrate the potential that can be achieved when re-designing classrooms in existing schools that formerly employed a traditional educational configuration. The employ of ‘island work stations’ combined with an aesthetic use of colors and the careful design of functional cabinets (e.g., bulletin boards, storage, etc.) can drive the learning methods that Cambodia’s schools desperately need to prepare its youth for the new century.



Figure 3.16 – Hands-on Science: The use of appropriately placed island work stations promotes the ability of science labs to present science concepts in a concrete manner with teachers playing the role of ‘facilitators’ rather than ‘controllers.’

Built-in cabinet units at the front of the classroom provide a whiteboard and bulletin boards to display project work while a wall-to-wall cabinet unit at the back can house scientific equipment, supplies, chemicals, and other materials to facilitate hands-on science instruction. The availability of copious cabinet space for educational supplies enables the school to adopt a subject classroom approach so that teachers do not have to carry around their own materials from room to room, as is usually the case in many Cambodian schools.



Figure 3.17 – Wall-to-Wall Cabinet Units: Multi-functional cabinets that include bulletin boards facilitate the display of student work while a wall-to-wall cabinet unit in the back of each lab can store huge amounts of science supplies to support hands-on science.

3.4 Multi-purpose Life Skills Classrooms

General Overview: The Multipurpose Life Skills Classroom provides a cost-effective and flexible design solution for an appropriate space for Career Guidance Counselling (CGC) classes and activities (including partnership with business and industry), as well as a space for supporting students in their developing and practice of life skills (such as entrepreneurship & leadership, lifelong learning skills, and soft skills) in Secondary Schools (SS). The room is designed to facilitate the new forms of teaching and learning that the Ministry of Education, Youth, and Sport (MoEYS) is promoting in its strong effort to prepare Cambodian children and youth for success in the 21st Century economy. In education today there is a greater emphasis on student collaboration, on creativity, and technology has become a standard part of every learning environment and this reality is intentionally incorporated into the Multi-Purpose Classroom.

What is a multi-purpose Life Skills Classroom? : A “multi-purpose classroom” can be simply defined as *“a room or space that is intentionally designed to support implementation for a variety of different activities with varying numbers and formations of participants.”*

Therefore, the layout of the room and the furniture are designed to enable and support instructional variety (such as: lectures, group work, one-to-one counselling, access to internet, independent work, presentations, Clubs) and to facilitate implementation of teaching approaches that actively engage students in their own learning.

Furniture in a multi-purpose room is purposely designed to be arranged in different styles that suit the type of instruction. Chairs and tables are light-weight and easy to move, to assure maximum flexibility in using the space. This will allow teachers and students to arrange the space to fit with the activities that will happen in the room. Furniture can be rearranged to allow for large or small lectures, seminars, group work, independent study, or anything else teachers and students might require.

Principles Underlying the Design of a Multi-Purpose Life Skills Room: Designers have created the layout of the Multi-purpose Life Skills Classroom with three basic principles in mind. These principles include the following:

1. **Forethought:** the room has been designed to accommodate Career Guidance Counselling activities and the practice of soft skills.
2. **Flexibility:** the furniture in the room can be quickly and easily arranged to accommodate different sizes of groups and different modalities of instruction.
3. **Functionality:** the room has all necessary basic equipment and storage so that everyone in the class can quickly and easily access the appropriate materials and space they need to do their work. It also accounts for the fact that there will be numbers of computers which need power sources, so electrical outlets should be situated around the room.

Purpose - What is the multi-purpose room supposed to be used for? The multi-purpose room is specifically designed to be used for implementation of Career Guidance Counselling (CGC) activities, including entrepreneurship and leadership, as well as student-industry partnerships. If the room is available, it can be used by students and teachers in different classes for practicing and developing soft skills (such as communications, research, presentation, and so forth). It can also be used to host occasional extra-curricular activities such as the thematic Clubs.³

Career Guidance Counselling also takes several forms. Sometimes it is taught in a lecture style, or with interactive components like group work. Sometimes it requires individual students to do independent research or give presentations. Sometimes, a CGC class will be taught by an outside expert who comes to the school to talk with students. And, sometimes CGC even happens off campus, such as when students go to visit a particular business or institution to explore career options.

One important style of CGC is one-to-one counselling, which is when the Career Counsellor works directly with a single student. This kind of interaction requires a quiet space where the information shared between the Counsellor and student remains confidential and cannot be overheard by other people.

Using and Maintaining the Multi-purpose Life Skills Classroom: Because the multi-purpose room does not belong to any one specific teacher (i.e., it is going to be used by different teachers and instructors), it is important to ensure that each school establishes clear guidelines for scheduling; storing materials in the room; cleaning the room; and maintaining the equipment and resources that are housed there.

Furniture Configuration and Architectural Details: The floorplan for a Multi-purpose Life Skills Classroom includes lightweight furniture, cabinets, and specialized equipment (see Figures 3.18 to 3.21 below). Two spacious cabinets, one at the front and one at the back of the room⁴, will be used to store equipment, manuals and other documentary resources, as well as a desktop computer to be used for presentations and research (see Figures 3.21A and B). The front-cabinet unit will include a whiteboard, a bulletin board, several storage shelves, and additional cabinet space. It will also contain a wall-mounted pull-down projector screen (see the equipment list below). One of the shelf areas in the front-cabinet will be used to house a desktop computer that can be connected to an LCD, which will be installed in the ceiling of the multi-purpose room. Electrical outlets must be located on this side of the classroom to serve this purpose.

Light-weight hexagonal-shaped desks that are easy to move around will be deployed in multiple configurations (circles, U-shaped, etc.) in order to facilitate group discussions, project work, and student presentations (see Figures 3.18 and 3.19). Currently, the classroom has been configured to seat 24 students but this number can be increased to accommodate additional needs in any given school (see floorplan in Figure 3.20).

³ **Note:** Thematic Clubs are designed to be conducted in the relevant classroom space – e.g., English language in the language classroom. However, it is recognised that there will be some aspects of club implementation that could benefit from using the multi-purpose classroom space. One example of this would be a presentation, since the multi-purpose room is equipped with an LCD and computer.

⁴ It is assumed that these rooms employ the Government standard of 7x8 m.



☛ **Figure 3.18A & B - Possible Furniture Configurations in a Multi-purpose Life Skills Classroom:** The different table shapes suggested for Multi-purpose Life Skills Classrooms should enable teachers to choose classroom configurations that best match their perceived needs as well as the pedagogical methodologies with which they are most comfortable (e.g., project work, problem-based learning). The examples provided in the pictures to the left illustrate some of the possible variations in furniture configuration that are possible.



Figure 3.19 – Front View of Multi-purpose Classroom: Front view of the classroom with a wall-to-wall cabinet unit with whiteboard, bulletin boards and pull-down screen. ↓



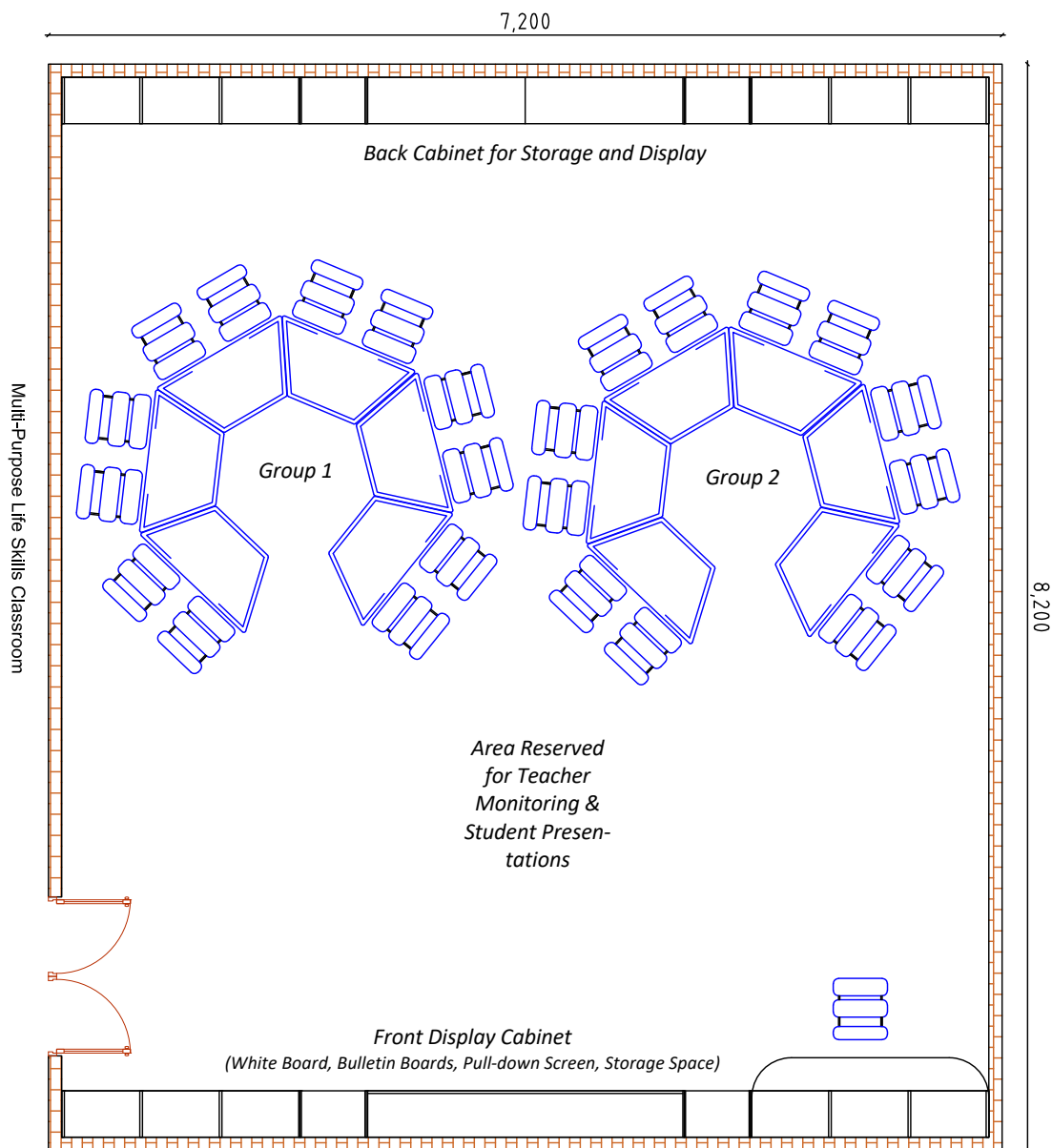


Figure 3.20 – Floorplan for a Multi-Purpose Life Skills Classroom: The above floorplan illustrates how furniture would be arranged in a classroom converted to this purpose of teaching life skills. The floorplan shows the placement of two wall-to-wall cabinet units at the front and back of the classroom as well as 12 hexagonal-shaped desks that can seat 24 students. This configuration facilitates student presentations, group work, and discussions.

The back-cabinet unit in a Multi-purpose Life Skills Classroom is designed to store needed educational materials and provide additional surfaces on which students can do project work. The design is somewhat different from that recommended in Non-science classrooms and science labs. Multi-purpose Life Skills Storage Cabinets provide more open space for the display of student projects and materials. In the future, additional computers may also be installed in this location, depending on the availability of resources. Electrical outlets will need to be located on this wall as well to facilitate the installation of computers and other electrical devices that may be needed to promote life skills education.

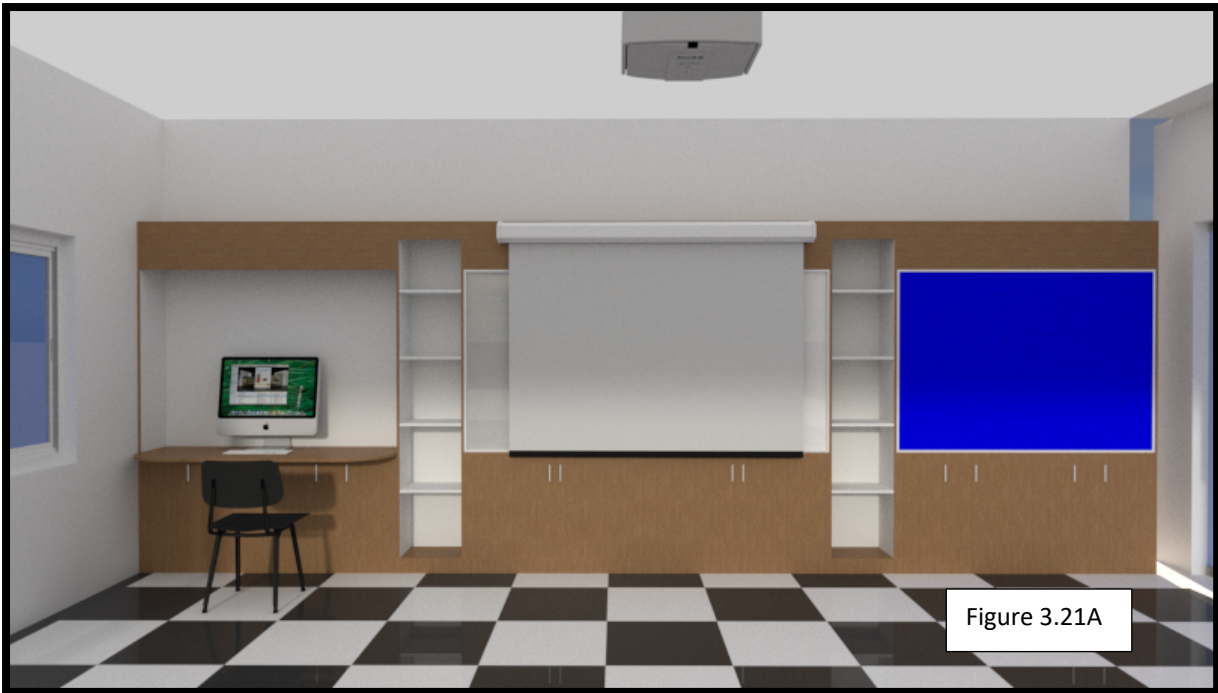


Figure 3.21A



Figure 3.21B

Figures 3.21A & B: The design illustrations above show the design of front (Figure 3.21A) and back (Figure 3.21B) cabinets that will be deployed in Multi-purpose Life Skills Classrooms. They are similar in design to those used in Non-science Classrooms but are also slightly different in that they possess special display areas for student projects and equipment including the emplacement of a desktop computer in the front cabinet. These cabinets are 40 cm in depth and will provide an efficient use of space to house significant amounts of equipment and materials needed for teaching various life skills topics.

The suggested material to be used for both cabinets and students' desks is MC plywood board covered by Formica (see Figures 3.22A and B). This is a cost-effective and durable material that has been used successfully in Cambodian schools. The proposed cabinet



Figure 3.22A

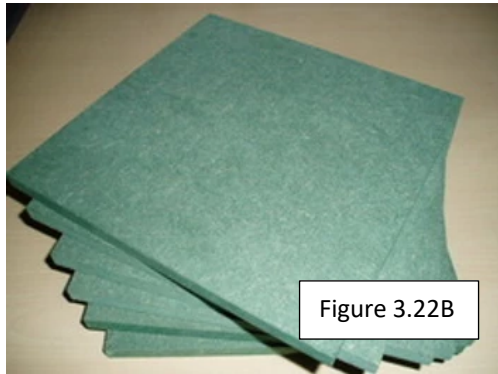


Figure 3.22B

Figure 3.22A & B – Raw Materials for Formica Furniture: The building materials shown above are both durable and ensure flexible design to meet the contours of any classroom. The top picture (A) shows formica veneer sheets, which comes in multiple colors and the pressed plywood sheeting (B) to which it is applied.

design can be customized, based on a school's requirements (e.g., adding more cabinets or shelves; distributing shelving in different ways, etc.).

A movable whiteboard is included in the suggested equipment, for students to use during group work, an essential component of CGC and promotion of life skills. This movable whiteboard is in addition to the whiteboard situated in the front cabinet. An option is to have additional whiteboard/s, or bulletin board/s also mounted on one of the two side walls where there are no cabinets.

It is important to note that this multi-purpose room is not equipped with a separate desk for the teacher, though there is a designated chair available for the teacher because he/she is expected to be working in a creative way with students. This solution optimizes the limited space for student activities and encourages teachers to move around in the classroom and engage with students.

As noted above, teachers will have access to a desktop computer/LCD for teaching; there are flat surfaces they can use during teaching (to hold their lesson plans, etc.); they can use the front cabinet to store documents; and they are encouraged to move around the classroom to observe and interact with students as they are complete assigned tasks and project work.

4. PROCUREMENT PLANNING

The design specifications presented in this framework document are intended to provide general recommendations that are both realistic in terms of their cost as well as optimum in their guidance to improve learning environments in multiple facilities that will be upgraded under the USE-SDP 2 Project (e.g., libraries, science labs, etc.). Detailed specifications and costings are provided in the annex of this document (**see Annexes 1 to 7**) for those responsible for procurement to map out what might be possible with regards to planned investment in target schools in the project. A summary of estimated costs are provided in Table 5.1 below.

Table 5.1: Estimated Procurement Costs by Facility

Facility Name	Estimated Cost	Relevant Institution
1. SRS Library	\$7,018	Secondary Resource School
2. One-Room Library	\$7,025	Network School
3. Two-Room Library	\$8,160	Network School
4. Color Coded Classroom	\$3,150	Secondary Resource School Network School
5. Science Lab	\$3,725	Secondary Resource School Network School
6. Multi-purpose Life Skills Classroom	\$5,000	Secondary Resource School Network School

Estimated costs are based on market research and past experience in similar procurement in the New Generation School System. Estimated values may vary. In addition, estimated costs may exceed the amount of money available in project budgets requiring reductions in the kind of and number of furniture and equipment to be purchased. The detailed costings provided in the Annex of this document should assist procurement planners to prioritize the most important items to procure and those that can be eliminated with the least impact to planned designs.

ANNEX 1: Furniture Procurement Plan for USE-SDP 2 Upgraded Educational Facilities

LIBRARIES

Furniture Item	Suggested Number of Units	Unit Cost (\$)	Total Cost
SRS Library			
1. TV Screen Console with Bulletin Board	1	\$772	\$772.00
2. Mini-theatre Seating (9.5m)	1	\$1,062	\$1,062.00
3. Cubby Hole Cabinets for Student Storage	1	\$424	\$424.00
4. Round Cabinet Unit	1	\$1,351	\$1,351.00
5. Wall-to-Wall Book Case Unit	1	\$1106	\$1,106.00
6. Padded Student Seating (in meters) (1set=1.6m)	7	\$138	\$966.00
7. Pillar Book Case	--	--	0
8. Research Station Unit (4 stations)	1	\$515	\$515.00
9. Circulation Desk (Librarian desk)	1	\$104	\$104.00
10. Small Bookcases (on the wall)	5	\$50	\$250.00
11. Reading Table (Optional)	1	\$240	\$240.00
12. Wall Mural (in sq meters)	12 sq meters	\$19	\$228.00
Subtotal			\$7,018.00
One-Room Library (Network School)			
1. TV Screen Console with Bulletin Board	1	\$772	\$772.00
2. Mini-theatre Seating (8.5m)	1	\$950	\$950.00
3. Cubby Hole Cabinets for Student Storage	1	\$690	\$690.00
4. Round Cabinet Unit	1	\$1351	\$1,351.00
5. Wall-to-Wall Book Case Unit	1	\$1106	\$1,106.00
6. Padded Student Seating (in meters) (1set=1.6m)	3	\$138	\$414.00
7. Pillar Book Case	--	--	0
8. Research Station Unit (2 stations)	1	\$615	\$615.00
9. Circulation Desk	1	\$104	\$104.00
10. Bulletin Board Divider at entrance	1	\$645	\$645.00
11. Small Bookcases	3	\$50	\$150.00
12. Wall Mural (in sq meters)	12 sq meters	\$19	\$228.00
Subtotal			\$7,025.00
Two-Room Library (Network School)			
1. TV Screen Console with Bulletin Board	1	\$772	\$772.00
2. Mini-theatre Seating (9.5m) ¹	1	\$1062	\$1,062.00
3. Cubby Hole Cabinets for Student Storage	1	\$424	\$424.00
4. Round Cabinet Unit	1	\$1351	\$1,351.00
5. Wall-to-Wall Book Case Unit	1	\$1106	\$1,106.00
6. Padded Student Seating (in meters) (1set=1.6m)	9	\$138	\$1,242.00
7. Pillar Book Case	1	\$360	\$360.00
8. Research Station Unit (4 stations)	1	\$515	\$515.00
9. Circulation Desk	1	\$610	\$610.00
10. Small Bookcases	5	\$50	\$250.00
11. Reading table	1	\$240	\$240.00
12. Wall Mural (in sq meters)	12 sq meters	\$19	\$228.00
Subtotal			\$8,160.00

COLOR CODED CLASSROOMS

Furniture Item	Suggested Number of Units	Unit Cost	Total Cost
1. Hexagonal Student Desks	18	\$47	\$846.00
2. Student Chairs	36	\$13.5	\$486.00
3. Front Cabinet Unit with Built-in White-board and Bulletin Boards	1	\$699	\$699.00
4. Back Cabinet Unit	1	\$917	\$917.00
5. Teacher's Desk	1	\$104	\$104.00
6. Teacher's Chair	1	\$13.5	\$13.50
7. Pull Down Screen	1	\$85	\$85.00
Subtotal			\$3,150.50




MODERN SCIENCE LAB




Furniture Item	Suggested Number of Units	Unit Cost	Total Cost
1. Sink Units with Marble Top	3	\$71	\$213.00
2. Student Work Tables with Marble Tops	6	\$147	\$882.00
3. Front Cabinet Unit with Built-in White-board and Bulletin Boards	1	\$699	\$699.00
4. Back Cabinet Unit	1	\$917	\$917.00
5. Teacher Display Station with Sink	1	\$339	\$339.00
6. Teacher's Chair	1	\$50	\$50
7. Student Stools	36	\$15	\$540.00
8. Pull Down Screen	1	\$85	\$85.00
Subtotal			\$3,725.00

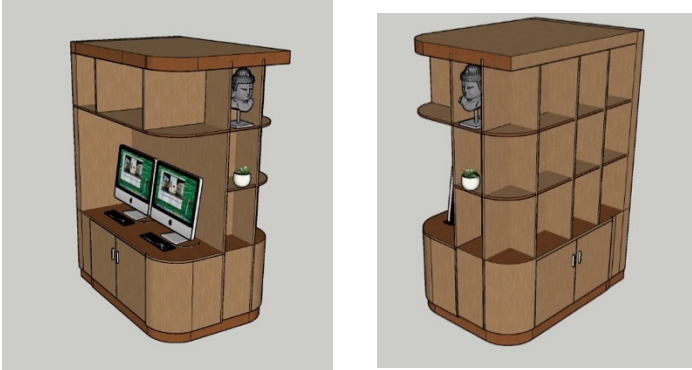
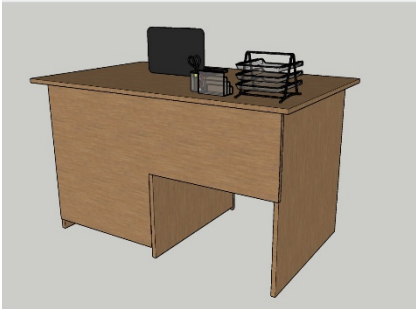
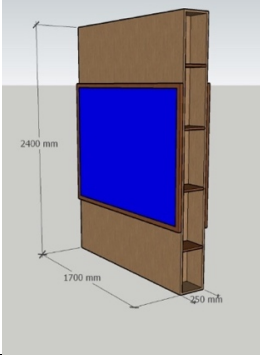
MULTI-PURPOSE LIFE SKILLS ROOM



Furniture Item	Suggested Number of Units	Unit Cost	Total Cost
Furniture			\$2,639
1. Student Desks	13	\$44	\$572
2. Student Chairs	26	\$12	\$312
3. Teacher Chair	1	\$50	\$50
4. Front Wall Cabinet Unit	1	\$755	\$755
5. Back Wall Cabinet Unit	1	\$950	\$950
Equipment			\$2,361
6. LCD projector	1	\$400	\$400
7. Pull Down Projector screen	1	\$200	\$200
8. Desktop Computer	1	\$600	\$600
9. Additional white board	1	\$150	\$150
10. Tablets	--	--	N/A
11. Miscellaneous supplies & equipment	<i>Lumpsum</i>	<i>\$1,311</i>	<i>\$1,311</i>
Subtotal			\$5,000

Annex 2: Library Furniture Specifications and Costings (One-Room)




ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
1. TV Screen Console with Bulletin Board	<p>The TV Screen Console has a Bulletin Board at its back and has the following dimensions:</p> <p>Length: 2.4 M Height: 2.4 M Width: 0.4 M</p>		\$772.00
2. Mini-theatre Seating (8.5m)	<p>Theatre Seating is located around the TV Cabinet and has the following dimensions:</p> <p>Length: 9.5 M Height: 0.75 M</p>		\$950.00
3. Cubby Hole Cabinets for Student Storage	<p>This Storage Cabinet Unit is adjoined to the TV Cabinet and has the following dimensions:</p> <p>Length: 5.2 M Height: 0.8 M Depth: 0.4 M</p>		\$690.00




ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
4. Round Cabinet Unit	<p>This unit has 5 shelves with double-sided display. It can hold 5,000 books. The Unit has the following dimensions:</p> <p>Height: 2.4 M Diameter: 2 M Shelf Width: 0.4 M</p>		\$1,351.00
5. Wall-to-Wall Book Case Unit	<p>This custom-made cabinet is bolted to the wall and has 6 shelves with a seating unit in the middle. It has the following dimensions:</p> <p>Length: 7 M Height: 2.4 M Depth: 0.4 M</p>		\$1,106.00
6. Padded Student Seating (in meters) (1set=1.6m)	<p>A Standard Seating Unit has the following dimensions:</p> <p>Length: 1.5 M Height: 0.75 M Depth: 0.6 M</p> <p>5 to 6 Units are generally placed in each NGS Library</p>		\$138 per meter
7. Pillar Book Case	--	--	0



ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
<p>8. Research Station Unit (2 stations)</p>	<p>The Research Console can hold 2 iMac desktop computers (or alternative desktops) (2 on the front side). The remainder of the console provides space for books, statuettes and storage space down below. It has the following dimensions:</p> <p>Length:1.2 M Height: 2.4 M Depth: 0.8 M</p>		<p>\$615.00</p>
<p>9. Circulation Desk</p>	<p>Circulation Desks in the SRS Library are wood tone in color and are placed in a position where librarians can easily monitor activities in the library. The Circulation Desk has the following dimensions:</p> <p>Length:1.10 M Width: 0.65 M Height: 0.75 M</p>		<p>\$104.00</p>
<p>10. Bulletin Board Divider at entrance</p>	<p>This divider has a bulletin board on both sides for announcements, student project work, etc. The divider is intended to be placed at the entrance of the library to help break up the space in the library. One side faces the entrance and the other faces the librarian’s sitting place. The dimensions of the divider are as follows:</p> <p>Length:1.7 M Depth: 0.35 M Height: 2.4 M</p>		<p>\$645.00</p>

ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
11. Small Bookcases	<p>These floating shelves can be affixed to a wall at great height above a seating area below and makes good use of wall space.</p> <p>Height: 0.8 M Length: 1 M Depth: 0.3 M</p> <p>Note: Picture shows two units</p>		\$50.00
12. Wall Mural (in sq meters)	<p>Wall murals that depict naturalistic settings help to bring some element of nature into the library, particularly when wood tones are used for the furniture. Wall murals are generally placed in a location to make the biggest impressions such as in this on-room library where the placement occurs at the entrance to the library so that it is the first thing that students see. Murals should generally be emplaced so that they go all the way up to the ceiling to give the maximum effect. The proposed placement requires approximately 12 square meters of wall paper.</p>		\$18/Sq Meter


Annex 3: Library Furniture Specifications and Costings (Two Rooms)

ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
<p>1. TV Screen Console with Bulletin Board</p>	<p>The TV Screen Console has a Bulletin Board at its back and has the following dimensions:</p> <p>Length: 2.4 M Height: 2.4 M Width: 0.4 M</p>		<p>\$772.00</p>
<p>2. Mini-theatre Seating</p>	<p>Theatre Seating is located around the TV Cabinet and has the following dimensions:</p> <p>Length: 9.5 M Height: 0.75 M</p>		<p>\$1,062.00</p>
<p>3. Cubby Hole Cabinets for Student Storage</p>	<p>This Storage Cabinet Unit is adjoined to the TV Cabinet and has the following dimensions:</p> <p>Length: 5.2 M Height: 0.8 M Depth: 0.4 M</p>		<p>\$424.00</p>




ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
4. Round Cabinet Unit	<p>This unit has 5 shelves with double-sided display. It can hold 5,000 books. The Unit has the following dimensions:</p> <p>Height: 2.4 M Diameter: 2 M Shelf Width: 0.4 M</p>		\$1,351.00
5. Wall-to-Wall Book Case Unit	<p>This custom-made cabinet is bolted to the wall and has 6 shelves with a seating unit in the middle. It has the following dimensions:</p> <p>Length: 7 M Height: 2.4 M Depth: 0.4 M</p>		\$1,106
6. Padded Student Seating (in meters) (1set=1.6m)	<p>A Standard Seating Unit has the following dimensions:</p> <p>Length: 1.5 M Height: 0.75 M Depth: 0.6 M</p> <p>6 Units are generally placed in each NGS Library</p>		\$138 (per meter)




ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
<p>7. Pillar Book Case</p>	<p>This bookcase is fitted around columns in the library should any exist. Its dimensions are as follows:</p> <p>Height: 1.5 M Length: 1.2 M (1 side) Depth: 0.4 M</p>		<p>\$360.00</p>
<p>8. Research Station Unit (4 stations)</p>	<p>The Research Console can hold 4 iMac desktop computers (2 on each side) or a normal desktop. An upper shelf can be used for display of globes, statuettes, and other educational material. The console includes fixtures for electrical outlets and also provides additional storage space below. It has the following dimensions:</p> <p>Length:1.2 M Height: 2.4 M Depth: 0.8 M</p>		<p>\$515.00</p>



ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
9. Circulation Desk	<p>The Circulation Desk in a two-room library is much larger than in the SRS or one-room library due to the extra availability of space. The desk can sit two to three librarians and possesses significant amounts of storage space on the side facing the librarian. The dimensions of the circulation desk in a two-room library are as follows:</p> <p>Length: 2.5 M Height: 1 M Depth: 0.65 M</p>		\$610.00
10. Small Bookcases	<p>These floating shelves can be affixed to a wall at great height above a seating area below and makes good use of wall space.</p> <p>Height: 0.8 M Length: 1 M Depth: 0.3 M</p> <p>Note: Picture shows two units</p>		\$50.00
11. Reading table	<p>The reading table can seat between six to eight students. Its color tone should match all other furniture in the library. Its dimensions are as follows:</p> <p>Height: 0.75 M Length: 2.4 M Width: 1 M</p>		\$240.00

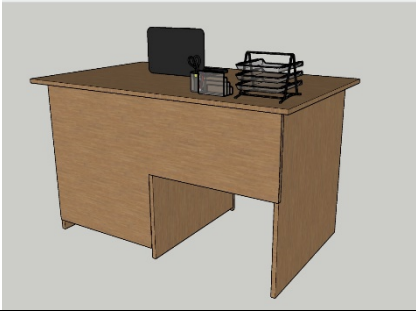


ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
<p>12. Wall Mural (in sq meters)</p>	<p>Wall murals that depict naturalistic settings help to bring some element of nature into the library, particularly when wood tones are used for the furniture. Wall murals are generally placed in a location to make the biggest impressions such as in this on-room library where the placement occurs at the entrance to the library so that it is the first thing that students see. Murals should generally be emplaced so that they go all the way up to the ceiling to give the maximum effect. The proposed placement requires approximately 12 square meters of wall paper.</p>		<p>\$18/Sq meter</p>


Annex 4: Library Furniture Specifications and Costings (SRS Library)

ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
13. TV Screen Console with Bulletin Board	<p>The TV Screen Console has a Bulletin Board at its back and has the following dimensions:</p> <p>Length: 2.4 M Height: 2.4 M Width: 0.4 M</p>		\$772
14. Mini-theatre Seating	<p>Theatre Seating is located around the TV Cabinet and has the following dimensions:</p> <p>Length: 9.5 M Height: 0.75 M</p>		\$1,062
15. Cubby Hole Cabinets for Student Storage	<p>This Storage Cabinet Unit is adjoined to the TV Cabinet and has the following dimensions:</p> <p>Length: 5.2 M Height: 0.8 M Depth: 0.4 M</p>		\$690

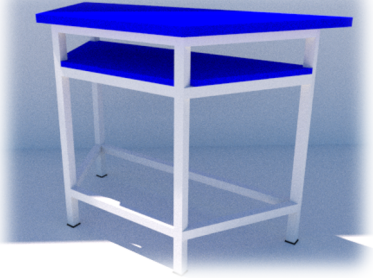


ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
<p>16. Round Cabinet Unit</p>	<p>This unit has 5 shelves with double-sided display. It can hold 5,000 books. The Unit has the following dimensions:</p> <p>Height: 2.4 M Diameter: 2 M Shelf Width: 0.4 M</p>		<p>\$1,351</p>
<p>17. Wall-to-Wall Book Case Unit</p>	<p>This custom-made cabinet is bolted to the wall and has 6 shelves with a seating unit in the middle. It has the following dimensions:</p> <p>Length: 7 M Height: 2.4 M Depth: 0.4 M</p>		<p>\$1,106</p>
<p>18. Padded Student Seating (in meters)</p>	<p>A Standard Seating Unit has the following dimensions:</p> <p>Length: 1.5 M Height: 0.75 M Depth: 0.6 M</p> <p>6 Units are generally placed in each NGS Library</p>		<p>\$138 (per meter)</p>




ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
<p>19. Pillar Book Case</p>	<p>This bookcase is fitted around columns in the library should any exist. Its dimensions are as follows:</p> <p>Height: 1.5 M Length: 1.2 M (1 side) Depth: 0.4 M</p>		<p>\$360</p>
<p>20. Research Station Console (4 stations)</p>	<p>The Research Console can hold 4 iMac desktop computers (2 on each side) or a normal desktop. An upper shelf can be used for display of globes, statuettes, and other educational material. The console includes fixtures for electrical outlets and also provides additional storage space below. It has the following dimensions:</p> <p>Length:1.2 M Height: 2.4 M Depth: 0.8 M</p>		<p>\$515</p>

ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
<p>21. Circulation Desk</p>	<p>Circulation Desks in the SRS Library are wood tone in color and are placed in a position where librarians can easily monitor activities in the library. The Circulation Desk has the following dimensions:</p> <p>Length:1.10 M Width: 0.65 M Height: 0.75 M</p>		<p>\$104</p>
<p>22. Librarian Chair</p>	<p>Material: steel and Ribbed synthetic leather with the following dimensions:</p> <p>Height: 0.80 M Width: 0.45x0.45 M Seat height: 0.45 M</p>		<p>\$50</p>
<p>23. Small Bookcases</p>	<p>These floating shelves can be affixed to a wall at great height above a seating area below and makes good use of wall space.</p> <p>Height: 0.8 M Length: 1 M Depth: 0.3 M</p> <p>Note: Picture shows two units</p>		<p>\$50</p>


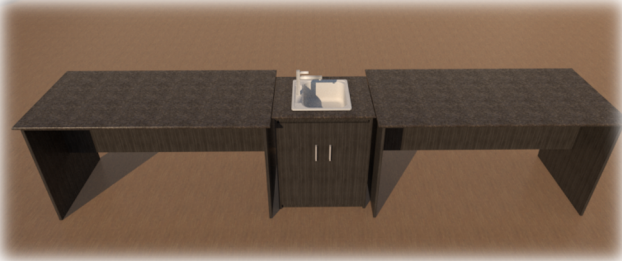

ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
<p>24. Wall Mural (in sq meters)</p>	<p>Wall murals that depict naturalistic settings help to bring some element of nature into the library, particularly when wood tones are used for the furniture. Wall murals are generally placed in a location to make the biggest impressions such as in this on-room library where the placement occurs at the entrance to the library so that it is the first thing that students see. Murals should generally be emplaced so that they go all the way up to the ceiling to give the maximum effect. The proposed placement requires approximately 12 square meters of wall paper.</p>		<p>\$18/sq meter</p>




Annex 5: Color Coded Classroom Specifications and Costings


ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
1. Hexagonal Student Desks	Student Desks are made of a steel frame (30 x 30 x 1.5 mm) and are spray painted with a white gloss. Each desk has the following dimensions: Length:1.1 M Width: 0.55 M Height: :0.75 M <u>Recommended Color Scheme</u> Blue: Soc. Science Red: Language Black: Math Orange: English		\$47
2. Student Chairs	This is a plastic chair with light metal frame of various colors (Vietnam Product Code 190). Chair Color is matched with Desk Color		\$13.5
3. Front Cabinet Unit with Built-in Whiteboard and Bulletin Boards	Front Cabinet Units include a white board at the center and two bulletin boards on either side with storage space at the bottom. The unit has the following dimensions: Length:7 M Height: 2.4 M Width: 0.35 M		\$699

ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
4. Back Cabinet Unit	<p>Storage Cabinet Units are wall-to-wall units with extensive storage space for educational supplies. They will be provided to all classrooms except the ICT Lab. Its dimensions are:</p> <p>Length: 6 M Height: 2.4 M Width: 0.35 M</p>		\$917
5. Teacher’s Desk	<p>Teacher Desks are white with a color strip around its top edge matching the color of the classroom. The Teacher Desk has the following dimensions:</p> <p>Length:1.10 M Width: 0.65 M Height: 0.75 M</p>		\$104
6. Teacher’s Chair	<p>This is a plastic chair with light metal frame of various colors (Vietnam Product Code 190). Chair Color is matched with Desk Color.</p>		\$13.5
7. Pull Down Screen	<p><u>Suggested size</u> Height: 2.5 M Width: 2.5 M</p>	<p>--</p>	\$85

Annex 6: Science Lab Specifications and Costings

ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
1. Sink Units with Marble Top	<p>The sink unit is made of a wooden frame with a marble top and stainless steel or ceramic sink set into the marble. The sink has two faucets so that it may be used by two groups simultaneously. The sink also has storage space under the sink and has the following dimensions:</p> <p>Length: 0.7 M Height 0.75 M Width: 0.5 M</p>		\$71
2. Student Work Tables with Marble Tops	<p>Lab Tables are made of MC ply wood and covered by formica laminated sheets. Table tops are made of black marble with a thickness of 18 mm. Each NGS lab is equipped with 3 table sets each of which has two tables and a sink. The table unit has the following dimensions:</p> <p>Length:1.5 M Width: 0.8 M Height: :0.75 M</p>		\$147 (per table)
3. Front Cabinet Unit with Built-in Whiteboard and Bulletin Boards	<p>Front Cabinet Units include a white board at the center and two bulletin boards on either side with storage space at the bottom. The unit has the following dimensions:</p> <p>Length:7 M Height: 2.4 M Depth: 0.35 M</p>		\$699

ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
<p>4. Back Cabinet Unit</p>	<p>Storage Cabinet Units are wall-to-wall units with extensive storage space for educational supplies. They will be provided to all classrooms except the ICT Lab. Its dimensions are:</p> <p>Length: 7 M Height: 2.4 M Depth: 0.35 M</p>		<p>\$917</p>
<p>5. Teacher Display Station with Sink</p>	<p>Teachers' Science Lab Desks will enable teachers to do classroom demonstrations of experiments. They are equipped with a black marble top, a sink, and storage underneath. They have the following dimensions:</p> <p>Length: 1.5 M Depth: 0.8 M. Height: 0.75 M</p>		<p>\$339</p>
<p>6. Teacher's Chair</p>	<p>Material: steel and Ribbed synthetic leather with the following dimensions:</p> <p>Height: 0.80 M Width: 0.45 x 0.45 M Seat height: 0.45 M</p>		<p>\$50</p>

ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST
7. Student Stools	Stainless Steel Lab Stools can be locally made. They have the following dimensions: Height: 0.45 M Diameter: 0.3 M		\$15
8. Pull Down Screen	<u>Suggested size</u> Height: 2.5 m Width: 2.5 m	--	\$85



Annex 7: Multi-purpose Life Skills Classroom Specifications and Costings


FURNITURE TOTAL COST.....\$ 2,639

EQUIPMENT TOTAL COST.....\$ 2,361

TOTAL COST FOR 1 RESOURCE SCHOOL MULTI-PURPOSE ROOM: \$ 5,000

FURNITURE DETAILS						\$2639
ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST	No. UNITS	TOTAL COST	
Student Desks (Qty: 13)	<p>Student Desks are made of a steel frame (30 x 30 x 1.5 mm) and covered with Formica material. Each desk has the following dimensions:</p> <ul style="list-style-type: none"> • Length:1.1 M • Width: 0.60 M • Height: :0.75 M 		\$44	13 desks	\$572	
Student Chairs (Qty:26)	<p>This is a plastic chair with light metal frame of various colors (Vietnam Product Code 190).</p>		\$12	26 chairs	\$312	

FURNITURE DETAILS					\$2639
ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST	No. UNITS	TOTAL COST
Teacher Chair	<p>H: 0.80 M W: 0.45x0.45 M Seat height: 0.45 M</p> <p>Material: steel and Ribbed synthetic leather</p>		\$50	1 chair	\$50
Front Wall Cabinet Unit	<p>Front Cabinet Units include a white board at the center and one bulletin board on one side with storage space at the bottom. The unit has the following dimensions:</p> <p>Length:7 M Height: 2.4 M Depth: 0.35 M</p>		\$755	1 unit	\$755

FURNITURE DETAILS					\$2639
ITEM NAME	SPECIFICATIONS	PICTURE	UNIT COST	No. UNITS	TOTAL COST
Back Wall Cabinet Unit	<p>Storage Cabinet Units are wall-to-wall units with extensive storage space for educational supplies. The unit has the following dimensions:</p> <p>Length: 7 M Height: 2.4 M Depth: 0.35 M</p>		\$950	1 unit	\$950

EQUIPMENT DETAILS				\$ 2,361
ITEM NAME	SPECIFICATIONS	UNIT COST ⁵	No. UNITS	TOTAL COST
LCD projector	Standard LCD	\$400	1 projector	\$400
Wall Mount Pull Down Projector screen	Suggested size <ul style="list-style-type: none"> • Height: 2.5 M • Width: 2.5 M 	\$200	1 screen	\$200
Desktop Computer	Minimum requirements; CPU: Core i3-7130U 2.7GHz 3M Screen 21.5" Full HD Frameless Ram: 4 GB DDR4 - OS: Windows 10 License	\$600	1 desktop computer	\$600
Additional white board	Movable or wall whiteboard	\$150	1 whiteboard	\$150
Tablets	<i>Already purchased by the MoEYS</i>	N/A		N/A
<i>Additional materials, supplies, equipment</i>	--	<i>Lumpsum</i>	--	<i>\$1,311</i>

⁵ Estimated costs, based on an average price in local shops.