



Integratory project rehabilitation of abandoned buses for the creation of a theater

Proyecto integrador rehabilitación de buses abandonados para la creación de un teatro

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Abstract

The present investigation idealizes the creation and optimization of a space for a project which will promote environmental sustainability and the heritage of the institution in order to promote the enrichment of culture and promote the performing arts, with this we can say that creative and innovative projects fascinate the world of learning and entertainment theater will shape the arts experience on campus as it continually seeks new ways to engage students beyond the traditional barriers of learning and entertainment. This creation arises from the need to improve the rudimentary skills of the study, learning and entertainment part, this open-air theater or theater with buses is presented as an artistic expression that takes place in the open sky where presentations can be performed of free expression, either by students or in conjunction with teachers or other private entities.

Keywords: project, culture enrichment, involve, rudimentary skills, free expression presentations

Resumen

La presente investigación idealiza la creación y optimización de un espacio para un proyecto el cual fomentará la sostenibilidad ambiental y el patrimonio de la institución para así promover el enriquecimiento de cultura y fomentar las artes escénicas, con esto podemos decir que los proyectos creativos e innovadores fascinan el mundo del aprendizaje y el entretenimiento el teatro dará forma a la experiencia artística en el campus, ya que busca continuamente nuevas formas de involucrar a los estudiantes más allá de las barreras tradicionales de aprendizaje y entretenimiento. Esta creación surge de la necesidad de mejorar las habilidades rudimentarias de la parte del estudio, el aprendizaje y el entretenimiento, este teatro al aire libre o teatro con autobuses se presenta como una expresión artística que se desarrolla a cielo abierto en donde se podrán ejecutar presentaciones de libre expresión, ya sea por estudiantes o en conjunto con los maestros u otros entes particulares.

Palabras clave: proyecto, enriquecimiento de cultura, involucrar, habilidades rudimentarias, presentaciones de libre expresión.

1. Introduction.

The contribution of arts and culture at institutional level is a privilege that allows the development of creative expressions, strengthening the skills of young people. This project aims to recover the use of abandoned vehicles, converting them into functional spaces dedicated to reading activities, art and culture for the student community.

1.1. Objective.

To propose the design of an open-air cultural and artistic space, reusing abandoned buses as part of the infrastructure of the Instituto Tecnológico in the city of Babahoyo.

1.2. Background.

In Ecuador there are very few theatrical spaces, according to studies there are a total of 61 theatres of

which 25 are in Quito, another 6, 4 in Riobamba, 2 in Ambato and the rest are spread throughout the country in its most civilized areas [1]. Similarly, the number of abandoned buses that exist in Ecuador is notorious and uncountable, and thanks to these, the percentage of scrap metal waste in our city and country has had a considerable environmental impact.

Through studies and questioning, it is clear that the number of theatres that promote the reduction of environmental impact through the reuse of abandoned buses or vehicles in the city of Babahoyo are null, since there is currently only the well-known artist's square, which for the current 2023 is practically in disuse, as indicated (Up to date the first digital newspaper of the rivers February 18 2022) [2], this square went from being beautiful and striking to being the square of

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oblivion. This does not include the presentation of artists and plays as was the custom in previous years.

By notable precedent, theatre spaces in Babahoyo are part of a few educational institutions. These allow a small capacity of people, but none of these spaces have opted for the need to promote the society to know how to help reduce the environmental impact.

On the other hand, the objective is to immediately promote the cultural part in order to promote and inculcate it in our next generations.

"To walk through the streets of Babahoyo is to breathe history in every corner, to remember traditions that endure through time from generation to generation and to experience art in its maximum expression" (Babahoyo city council) [3] the environmental impact forces us to be aware that we must look for alternatives that help to reduce the environmental impact, the initiative to rehabilitate what was considered scrap metal and give it a twist, thanks to creativity, will allow the work generated by the environment in the city of Babahoyo to be recognized.

Under these circumstances we are given to know that the theatres within the city of Babahoyo are really non-existent, and the recycling of vehicles dumped as scrap metal is also non-existent. As far as theatres are concerned, there are few that we have, and few institutions that have decided to implement these spaces that, if we name them, these would be; the technical university of Babahoyo with its auditorium of arts and conferences Bolívar Lupera; the educational unit Emigdio Esparza Moreno with its auditorium, but what we do have in excess are abandoned vehicles not only in the canchones if not along the streets of the city and even more disused buses both inside and outside the institutions that make up Babahoyo.

In the same way, we can see that in these events we realize that theatres are scarce in our city and even more so the implementation of the reuse of buses in order to reduce the environmental impact, not only in our city but also at the level of our province.

1.3. Basic meanings.

Theatre is one of the oldest cultural and artistic activities known to mankind. It is one of the performing arts, that is to say, those that take place on a stage, and consists of the recreation of one or more stories of different kinds by means of actors, speeches, music, and scenery.

Environmental sustainability represents a way of living in balance with our environment and preventing scarcity that can put humanity at risk, which makes this issue

necessary for every person, organization and government on the planet.

It is also the one that focuses on preserving biodiversity without renouncing economic and social progress. The bases of environmental sustainability are: taking care of water, saving energy, reducing waste, using recyclable packaging, limiting, or eliminating the use of plastics, using sustainable transport, reusing paper, and taking care of flora and fauna. [4]

1.4. Procedures.

The creation of the theatre starts with the restoration, adaptation, and location of the buses to obtain a fully functional space.

These selected buses will be carefully transformed and placed in the shape of a letter u, in order to obtain an endowed space that will include, in one part of it, a stage, which will be equipped with lighting and sound systems. At the front, seats for the audience, spaces for the cast and crew.

The interior of the bus behind the stage will be designed and modified in such a way that it can be adapted according to the needs of future performances.

The others will be placed on the sides and transformed as part of the space for the spectators, implementing the adaptation of platforms on them to obtain a better coexistence of the public towards the space and the presentations.

1.5. In detail.

The team of specialized engineers on site will carry out the planning and adaptation of the existing structures (the buses). They will be responsible for the rehabilitation of the buses into a static theatre. By making modifications to the exterior to create a striking theatrical façade in accordance with the environment, taking into account the orientation of the sun and the direction of the winds, a stage area will be designed for theatrical and other performances and an area for the public.

Inside one of the buses the dressing room area, technical area, lights, and illumination will be conditioned with this design, it is proposed to consider the space to expand it in such a way that people who are outside the design area, can observe the presentations.

The design consists of a platform on which the stage will be mounted, with ecological roofing and on each bus will be placed covers in order to create protection from the rain and sun for the comfort of those who use these structures.

It is required that this space works not only in the theatrical concept, but also that it is coupled to the



concept that the space can be used beyond a theatre, for that we plan to create a versatile space in which it is used to academically promote the provision of project ideas to the public by the students themselves. So we are also looking to add a library or reading space in some way to promote activities that develop the cognitive integrity and learning of young people.

1.6. Versatility of space.

Versatility" means the ability of a space to adapt to different functions with the least change to the system, minimizing complexity or effort. [5]

Space and its appropriate distribution are one of the biggest complications when it comes to making the most of and exploiting an area. That is why coherence between design and function is one of the most important issues when considering an architectural solution for an environment. [6]

One of the key advantages of the location of this project will be its ability to adapt to various situations in this environment. As this space will not be created to be limited to its specific use, it can really be approached to communicate and give access to all kinds of performing arts. This opens up new possibilities to encourage creativity, and the theatre can also serve as a platform to promote emerging and necessary conferences, thus fostering local information and enriching knowledge.

This space will extend not only the life of knowledge as our humanity has been doing since the time of our creation, but also that our culture will persist and be recreated for more generations, as our ancestors did and as we continue to do.

1.7. Design and planning.

"Architecture is the art of spending space". (Philip Johnson.)

"The simple joy of taking an idea into your own hands and giving it proper form is thrilling". (George Nelson.) [7] [8]

The simple joy of taking an idea into your own hands and giving it the appropriate form is exciting. [9]

When planning a project, design and construction should ideally work as an integrated system. The design and construction processes are closely related and should be given equal importance by those in charge of your project. Generally speaking, design is a process of creating the conceptualization of a new facility in detailed drawings and with its own technical specifications. [10]

We designed this space because we felt the need to innovate in our socio-recreational spaces. We also opted

to restore the buses and improve the space to achieve a correct ambience and visualization of everything already mentioned, as we are not only looking to restore but also to adapt and condition all the internal space of the buses based on designs already planned for this space and at the same time expanding it, in order to optimally improve the whole project. Additionally, in some parts of this project we will introduce a space that will improve the practice and sociability with the student and academic environment being physical libraries or spaces for general consultation in terms of academic information or topics of mass knowledge, thus changing the rudimentary environment that this institution has.

The professionals in charge of this project consider that, for a good planning, it is necessary to analyze all the resources beforehand in order to adapt them to the needs that we require, as well as to opt for an optimal planning of the implementation of the anthropometric measurements in order to distribute all the space correctly and optimally to achieve the highest possible capacity of users.

1.8. Infrastructure and services.

Infrastructure is a set of facilities, services and technical means that support the development of activities. [11]

In order to guarantee the correct functioning of the static theatre, the necessary adaptations will be made, in terms of electricity and security system, electrical power connections were established, and ventilation and temperature control systems were implemented to ensure the comfort of the spectators and the cast.

Similarly, the science of anthropometry is used to achieve the best distribution of spaces according to the measurements of the average entity, so that in case of natural disasters such as earthquakes or telluric movements or other types of accidents, a correct and rapid evacuation can be achieved.

Likewise, as a safety method, the use of fire extinguishers in case of fire or short circuits, and already foreseen signs, posters, and safety guides for evacuation as well as for the correct use and hygiene.

1.9. Context and challenge.

A campus with limited theatre space (none) and a shortage of cultural spaces, the group of directors of this prestigious institution set out to create a solution that would make the most of the available resources. They identified a number of disused buses due to age or decommissioning and opted for the opportunity to convert them into a static theatre.



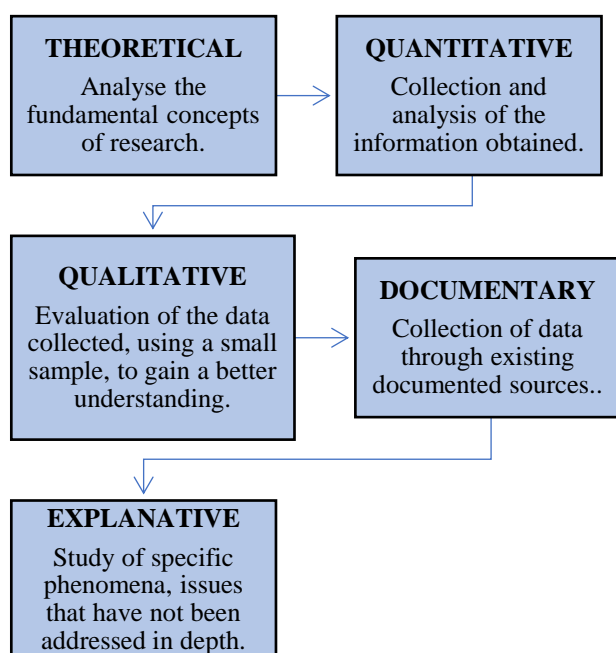
Likewise, this campus has no notable methods to help reduce environmental impact through the restoration of abandoned resources, let alone environmental awareness systems.

2. Methodology and materials used.

In the following, we will detail the methods that were effective in this research, as well as the materials used to create this open-air theatre.

2.1. Methodology.

Methods used in this research work:



2.2. materials, equipment, and basic steps.

- Cleaning and staking out
Unit: Square meter (m2).
Minimum materials. Strips of 4 cm by 5 cm, nails, pegs.
Minimal equipment, minor tool point.
- Restoration of buses.
Unit: Square meter (m2).
Minimum materials: Enamel paint, anti-corrosive paint, solvent, steel plates, welding 60.11.
60.11. Minimum point minor tools, electrical, cutter, grinder, air compressor.
- Platform and metal structures with roofing points
Unit: Square meter (m2).
Minimum materials. Profile g 150 by 15 by 2 mm. Weld 60 11, anti-corrosive paint, solvent, solvent, steel plate (1.22 * 2.44 meters) (2.5 mm Sierra brackets (59.54 kg)

Minimal equipment points minor tool, electric welding machine and profile cutter

- Supply and installation of galvalume roofing 0.30
Unit. Square meter (m2)
Minimum materials minimum item galvalume sheet 0.30 l = 3.00 mm, ridge 0.30 and self-drilling.
- Electrical installations.
Unit. Linear meter.
Minimum materials. Power flex cable (low voltage up to 1000 v. Halogen free. Halogen-free, Reflectors, dimmers, and brackets,
- Basic lighting
Minimum materials: (led lamps comma ceiling lamps comma wall lamps and ceiling lamps comma and led strips), basic insulators.
Minimum equipment. Minor tools, voltage detectors, multimeter, resistance tester, lamp tester, voltmeter [12].

3. Results.

The whole idea is based on using all possible resources to create it in the best possible way. The aim is to provide a whole new activity to the school in order to increase the cultural heritage of this Asia society.

3.1. Sustainability of this project.

We base the sustainability of this already mentioned space in the search to satisfy that thirst to improve our capacities by means of the culture and implementation of patrimonies Asia the culture not only ours if not to that of the city of Babahoyo satisfying this way the present generations and maintaining the future ones, this way at the same time to guarantee a considerable and notorious growth in our academic and social environment.

3.2. Environmental sustainability of this project.

We believe in sustaining this space with the need to preserve the environment and reduce the impact that it has by the waste of scrap metal and also implement the knowledge to provide young people to help reduce pollution through recycling and reuse.

3.3. Heritage.

Truth, like the sun, is no one's exclusive patrimony, but belongs to everyone and produces light and life for everyone. “ (Jeronimo Usera) [13]

We are strongly looking for this theatre to become a considerable and well-known heritage to the academic culture of our campus, because through it we seek to infuse all that knowledge necessary for the academic development and future professionals such as our

students, as well as to reduce the waste of scrap metal in the city.

3.4. Rendering of the project.



Figure N°1: General view of the project which has a capacity for 100 people for seats and 10 people standing on the ground floor and 15 people capacity on the upper floor.

3.5. Satellite location of the project.



Figure n°2: Aerial view of the site delimiting the location of the project

3.6. Architectural plan of the project.

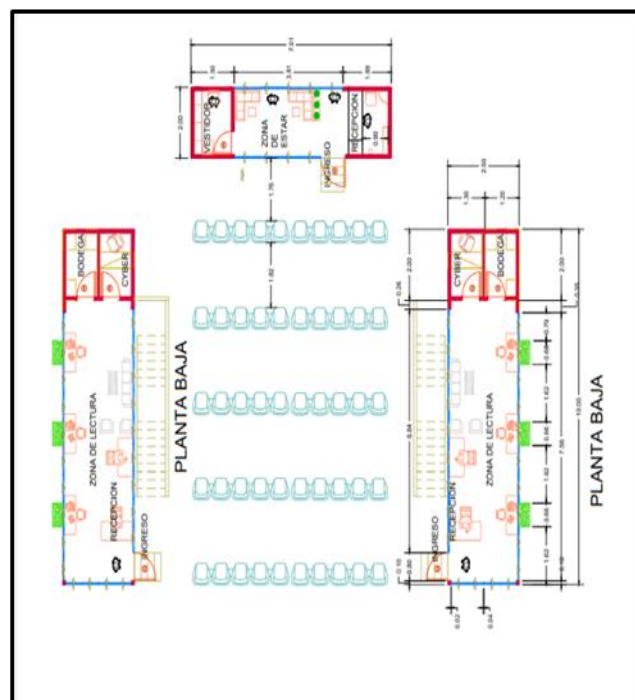


Figure No 3: Architectural plan of the project, plan view.

Arch space		
Space	Description	Area m2
Lounge	100 pers.	150
Front buses	25 pers.	50
Rear bus	25 pers.	50
Circulation	25 pers.	50
Total	175 pers.	300

3.7. Results.

The approval of the project is presented below in the form of percentages from the survey in 7 tables.

Table 1: Do you consider that theatre contributes to cultural, personal, and professional development?

VARIABLE	PERCENTAGE
Yes	92,9 %
No	0 %
Maybe	7,1 %
Total	100%

These data show that the majority of the surveyed population considers that the theatre will be a contribution to the development of the community.

For this reason, there is a need for the creation of the theatre to have a significant impact on the cultural, personal, and professional development of the people.



Table 2: How feasible do you consider the idea of having a theater within the institution?

VARIABLE	PERCENTAGE
Good	19 %
Very Good	38,1 %
Excellent	21,4 %
Necessary	21,4 %
Total	100%

These data reveal that a relative majority, although not overwhelming, consider it feasible for there to be a theater within the institution. This finding highlights the need for the construction of the theater since this space can be designed for multiple uses, such as conferences, presentations, events, etc.

Table 3: How do you consider the proposal to implement a physical library (multidisciplinary) within the cultural space?

VARIABLE	PERCENTAGE
Convenient	38,1 %
Necessary	38,1 %
Considerable	21,4 %
Not at all good	0 %
Total	100%

These results indicate that a significant proportion of respondents believe that it is feasible to implement a physical library within the cultural space as this would strengthen the educational and cultural offerings, provide a meeting place for the community, and enrich the overall experience of the space.

Table 4: How do you consider the importance and idea of implementing the restoration of buses for the creation of this space within the campus?

VARIABLE	PERCENTAGE
Excelente	45,2 %
Very Good	31 %
Good	19 %
Bad	0 %
Total	100%

These data show a positive and homogeneous condition to the availability regarding the restoration of buses for the creation of a space within the campus since it can have several advantages and contribute significantly to the educational institution.

Table 5 Culturally, do you think it is important to maintain the original design of the buses that are part of the environmental design of the theater.

VARIABLE	PERCENTAGE
Yes	79,3 %
No	20,7 %
Total	100%

These results highlight a strong perception with a clear majority recognizing the relevance of maintaining the original design of the buses that are part of the theater's environmental design. While the minority does not consider it necessary.

Table 6: Do you consider that within the institution there are cultural spaces that promote the reuse of scrap metal?

VARIABLE	PERCENTAGE
Yes	81 %
No	19 %
Total	100%

These data highlight that the majority of respondents consider it very important that within the institution there are cultural spaces that promote the reuse of scrap metal since maintaining cultural spaces that promote the reuse of scrap metal not only has environmental benefits, but also contributes to the creativity, innovation and cultural identity of the educational institution. These practices reflect a commitment to sustainability and can have a positive impact on the educational community and beyond.

Table 7: Do you think it is a good idea to help reduce the environmental impact of scrap metal waste?

VARIABLE	PERCENTAGE
Yes	74,47 %
No	25,53%
Total	100%

This data indicates that the majority of respondents believe it is a good idea to help reduce the environmental impact of scrap metal waste because helping to reduce the environmental impact of scrap metal is a positive idea that contributes to sustainability, resource conservation and the promotion of responsible practices. So these actions can have a long-term impact on the health of the planet and the environmental awareness of society..

4. Conclusions.

After having identified the benefits of this project as part of the institute's infrastructure, research was carried out on analogous models that provide ideas that can be



reflected in the design, concluding that the importance of recycling objects not only means helping to reduce the environmental impact, but can also give way to the creation of new elements that promote the development of academic or social activities.

The prototype design of the buses was presented through architectural plans, renderings and a model, in order to show the distribution of spaces, facade design and public use areas, highlighting the important parts for the creation of this integrated project such as the library area, artistic scenarios.

Once the project has been approved and concluded, the intention is to hold the inauguration event, which will show the entire student community the facilities designed for learning and entertainment, through the use of the library, presentation of plays, dance, music, and all kinds of events that lead to healthy recreation.

It is also concluded that this project will seek integration through partnerships with local groups, the art conservatory and community organizations, promoting cultural growth, and awareness of recycling and creating new uses for elements that were destined for scrap.

Referencias.

- [E. T. -. N. d. E. y. d. mundo, 01 abril 2013. [En línea]. Available:
1 <https://www.eltelegrafo.com.ec/>.
]
- [marlon, «aldia el primer diario digital de los rios,» 18 febrero
2 2022. [En línea]. Available: [www.aldia.com.ec/plaza-del-artista-
\]](http://www.aldia.com.ec/plaza-del-artista-paso-a-ser-la-plaza-del-olvido/) paso-a-ser-la-plaza-del-olvido/.
- [m. d. babahoyo, «alcaldia ciudad de babahoyo,» [En línea].
3 Available: <https://babahoyo.gob.ec/historia>.
]
- [S. Universidades, «Santander,» 9 marzo 2022. [En línea].
4 Available: [https://www.becas-santander.com/es/blog/que-es-la-
\]](https://www.becas-santander.com/es/blog/que-es-la-sostenibilidad.html) sostenibilidad.html. [Último acceso: 26 agosto 2023].
- [G. Valenciana, «Guía Verde,» 16 marzo 2020. [En línea].
5 Available: [https://guiaverda.gva.es/es/versatilitat-i-convertibilitat-
\]](https://guiaverda.gva.es/es/versatilitat-i-convertibilitat-de-l-espai) de-l-espai. [Último acceso: 20 agosto 2023].
- [T. Montes, «la versatilidad del espacio en el diseño,» 28 febrero
6 2018. [En línea]. Available: [https://decortips.com/es/casas-la-
\]](https://decortips.com/es/casas-la-versatilidad-del-espacio-en-el-diseno/) versatilidad-del-espacio-en-el-diseno/.
- [C. Mario, «La arquitectura es el arte de gastar el espacio,» 19
7 septiembre 2022. [En línea]. Available:
8 [https://www.revistaad.es/decoracion/articulos/25-frases-
\]](https://www.revistaad.es/decoracion/articulos/25-frases-inspiradoras/18182#:~:text=%22La%20alegr%C3%ADa%20simple%20de%20tomar,bien%20permanece%20en%20el%20tiempo%22..) inspiradoras/18182#:~:text=%22La%20alegr%C3%ADa%20sim-
9 ple%20de%20tomar,bien%20permanece%20en%20el%20tiempo
10 %22.. [Último acceso: 2023].
- [A. Carlota, «La alegría simple de tomar una idea en tus propias
11 manos y darle la forma apropiada es emocionante,» 19 septiembre
12 2022. [En línea]. Available:
13 [https://www.revistaad.es/decoracion/articulos/25-frases-
\]](https://www.revistaad.es/decoracion/articulos/25-frases-inspiradoras/18182#:~:text=%22La%20alegr%C3%ADa%20simple%20de%20tomar,bien%20permanece%20en%20el%20tiempo%22..) inspiradoras/18182#:~:text=%22La%20alegr%C3%ADa%20sim-
14 ple%20de%20tomar,bien%20permanece%20en%20el%20tiempo
15 %22.. [Último acceso: 2023].

- [C. Oscar, «“El teatro es poesía que se sale del libro para hacerse
9 humana.”,» 18 septiembre 2017. [En línea]. Available:
10 [https://psicologiaymente.com/reflexiones/frases-federico-garcia-
\]](https://psicologiaymente.com/reflexiones/frases-federico-garcia-lorca) lorca. [Último acceso: 2023].
- [M. Construcciones, «Aspectos para la planificación de diseño,» 1
1 julio 2020. [En línea]. Available:
2 [https://meprosaconstrucciones.mx/aspectos-para-la-planificacion-
\]](https://meprosaconstrucciones.mx/aspectos-para-la-planificacion-de-diseno-y-desarrollo-de-proyectos-de-construccion/) de-diseno-y-desarrollo-de-proyectos-de-construccion/. [Último
3 acceso: 20 agosto 2023].
- [S. Ferrovia, «Ferrovia,» 10 febrero 2023. [En línea]. Available:
1 <https://www.ferrovial.com/es/recursos/infraestructura/>. [Último
2 acceso: 26 agosto 2023].
3]
- [u. p. s. ecuador, «universidad politécnica saleciana,» 11 abril
1 2023. [En línea]. Available: <https://www.ups.edu.ec/>.
2
3]
- [J. Usera, Artist, *La verdad, como el sol, no es patrimonio
1 exclusivo de nadie, sino que pertenece a todos y para todos
2 produce luz y Vida.* “. [Art]. 2023.
3]