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# A Post-Revitalization Model Learning for Fort Willem I as an Open History Laboratory

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### Abstract

This article explores the revitalized Willem I Fort as an “Open History Laboratory” to support contextual history learning. Visiting historical buildings in person can help students understand history lessons empirically. The purpose of this study is to analyze the fort’s historical potential and formulate strategies for utilizing Willem I Fort as a dynamic contextual learning resource. The research method used is qualitative, specifically a literature review. The results indicate that Fort Willem I holds historical potential that can be incorporated into history education. The revitalization efforts support the optimization of its educational functions. The proposed strategies include inquiry-based educational zoning, implementation of Contextual Teaching and Learning (CTL), digitization of knowledge, and strategic collaboration. The transformation of Fort Willem I into an open history laboratory can synergize aspects of pure and applied history, supporting the improvement of historical literacy, awareness of cultural heritage preservation, and students’ critical thinking skills through direct interaction with material evidence from the past.

### Keywords

contextual history learning; Fort Willem I; model learning; open history laboratory; revitalization

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## Introduction

History should not be understood solely through texts and narratives, but also through the material remains that have survived to this day. This is because history has many witnesses, including traces of the past that are still visible and hold great value ([Pramartha, 2022](#)). Historic buildings, cultural heritage sites, and spaces that preserve the past serve as vital tools for understanding the social, political, economic, and cultural dynamics, as well as the identity of a nation. In an educational context, the presence of historical sites can provide a more concrete and contextual learning experience because students can interact directly with primary historical sources. Therefore, the use of cultural heritage sites in history education is crucial for fostering historical awareness while strengthening students' connection to their local historical environment ([Umam, 2025](#)).

There are still many historical sites that have not been thoroughly explored in the field of education, one of which is Fort Willem I (Benteng Pendem Ambarawa). Built during the Dutch East Indies period around 1834–1845 and inaugurated in 1846, the fort was part of the colonial defense system following the Diponegoro War ([Sekundiana et al., 2023](#)). It is also explained that, in addition to its historical value as a center of colonial military defense, Fort Willem I also showcases a blend of European architecture and adaptations to the tropical Javanese environment, reflecting the process of cultural interaction during the colonial era.

The revitalization, completed on November 17, 2025, opens new opportunities for its use as a public educational space. However, various cultural heritage revitalization programs in Indonesia generally remain focused on physical conservation and tourism development, while their educational functions have not been optimally developed. In fact, Fort Willem I should be able to “speak” to the public through adequate interpretation so that it does not remain merely a passive artifact ([Risaliti et al., 2026](#)). To date, Willem I Fort has primarily served as a tourist attraction, with no evident educational function. The revitalization efforts have been purely physical, and there is still very little written or posted information on-site. The revitalized spaces have merely become aesthetically pleasing spots for taking selfies. This study aims to explore the added value that can be derived from the revitalization of Willem I Fort in the realm of education—an aspect that has not been previously discussed.

Merrianda (2018) previously conducted research showing that Fort Willem I could be utilized as a historical learning resource for 12th-grade students at Kanisius Bhakti Awam High School in Ambarawa. However, the spatial context of that research predated the revitalization efforts. As a result, students were enthusiastic about visiting the fort in person. Fort Willem I, which has now been revitalized, can become part of the learning process at school. The Coordinating Minister for Infrastructure and Regional Development, Agus Harimurti Yudhoyono, in an interview with the media on [ciptakarya.pu.go.id](http://ciptakarya.pu.go.id), noted that this fort could become a favorite public space for the younger generation. The revitalized building can bring a fresh perspective to learning.

Nevertheless, a reality that must be acknowledged is the persistent gap between the existence of historical buildings and the practice of history education in schools. History education at the high school level remains trapped in a focus on memorizing content ([Deisanti & Listyaputri, 2026](#); [Iffa, et al., 2026](#); [Putra & Nasution, 2025](#)). Although visualization-based learning has been implemented, its application is still limited to in-class media and has not yet optimized direct interaction with historical sources ([Widiastuti, et al., 2023](#); [Herlinda, et al., 2021](#)). However, learning can be maximized if visualization is conducted directly with the objects being discussed.

In this context, Fort Willem I holds great potential as a source of contextual learning because it embodies complex historical, architectural, and social values. However, the fort is still often viewed merely as a visual and aesthetic tourist attraction, lacking a deeper historical understanding. The revitalization efforts undertaken by the government so far have focused primarily on the physical conservation of the building, while its educational function has not yet

been fully developed. Therefore, Fort Willem I needs to be developed as an “open history laboratory” capable of facilitating site-based learning experiences so that students can understand history in a more contextual and meaningful way ([Suranti & Karsiwan, 2025](#); [Choirunnisa & Zuhri, 2026](#)).

This research is important for history education by utilizing historic buildings as learning resources. The revitalization of Fort Willem I is not merely a physical renovation of the building but also aims to restore the building’s “spirit” so that it can forge a connection with current and future generations. This research is also grounded in cultural preservation by utilizing historic spaces to safeguard the nation’s collective memory. Furthermore, pedagogical transformation through the implementation of place-based learning as a teaching model enables students to conduct direct observations of historical heritage sites ([Arrazaq, 2026](#); [Dalimunte et al., 2025](#); [Fakhruddin et al., 2024](#)).

Research on Fort Willem I has generally focused on the architecture, conservation, and adaptive reuse of colonial buildings ([Harjanti, 2016](#); [Sekundiana et al., 2023](#); [Putri & Ikaputra, 2025](#)), while studies on history education have been limited to the use of the fort as a conventional learning resource prior to its revitalization ([Merrianda, 2018](#)). However, previous research has not examined how the revitalization of a heritage site can be transformed into a living laboratory-based history learning model that integrates contextual pedagogy, digital interpretation, and community engagement.

The research gap discussed in this article aims to utilize the post-revitalization condition of Fort Willem I as an open historical laboratory that not only emphasizes conservation but also integrates contextual history learning, interpretive digitization, community collaboration, and connectivity with the cultural heritage creative industry ecosystem. This study seeks to analyze the building’s potential as a medium for visualizing history from the colonial era to the present. The already adequate physical revitalization can be supported by adding diverse information and adapting the space to align with existing historical narratives. The uniqueness of this research lies in the development of a model for utilizing cultural heritage sites as living laboratories that integrate aspects of preservation, historical pedagogy, technology, and social empowerment. Visualizations supported by adequate information will ensure that visitors’ understanding of the building’s functional dynamics is fully met.

The use of Fort Willem I as an open-air history laboratory supports one of the pedagogical concepts known as Contextual Teaching and Learning (CTL). CTL emphasizes students’ active engagement in understanding the material through real-world experiences ([Sepriady, 2018](#)). History education is no longer dogmatic but inquiry-based, enabling students to analyze the connections between Fort Willem I and the railroad, colonial strategies in Ambarawa, and social structures during the Dutch East Indies period ([Firmansyah, 2024](#); [Ningrum et al., 2025](#)). In this context, synergy between history and pedagogy is crucial to ensure that revitalization does not compromise the authenticity of the site but rather reconstructs historical facts accurately and in an educational manner ([Yarangga et al., 2021](#); [Hasirun et al., 2025](#)). CTL is one option that can be applied in the open history laboratory model, as it allows students to understand that history does not end in the past but continues to live on through the community’s interaction with this colonial heritage.

Based on the background and issues outlined above, this study aims to: 1) analyze the historical potential of Fort Willem I, and 2) develop strategies for utilizing the revitalized Fort Willem I as an open-air history laboratory. This study combines the disciplines of history and pedagogy, and it is hoped that it will make a tangible contribution to more dynamic history education, as well as support efforts toward the sustainable preservation of cultural heritage sites in Indonesia.

## Method

The method used in this study is qualitative, incorporating a literature review. This method was chosen to gain an in-depth understanding of the phenomenon of historic building utilization through the interpretation of policies related to revitalization and history education. The literature review was used to collect, integrate, and analyze data from various written sources, specifically journal articles, to address the challenge of transforming Fort Willem I into an open history laboratory. Document analysis was conducted to help understand the context and gain a broad perspective on the research topic ([Charmaz & Belgrave, 2015](#)).

The research stages, as outlined by [Sholikhah \(2019\)](#), are: 1) the orientation or descriptive stage, 2) the reduction stage, and 3) the selection stage. The collected data were analyzed using content analysis and descriptive-analytical methods. The analysis procedure followed the model by [Miles et al. \(1992\)](#), which consists of: 1) Data Reduction, 2) Data Presentation, and 3) Drawing Conclusions and Verification.

This study also presents government policy documents on revitalization by accessing the relevant official websites. The maps and photographs from the Dutch colonial era used in this study were obtained from official sources, including the digital collection of Leiden University and the Dutch National Archives. The credibility of these websites has been verified, allowing them to be used as supporting materials for this study.

To ensure the quality of this research, a triangulation technique was employed. The researcher examined the phenomenon of Fort Willem I's utilization not only from a historical perspective but also from an educational perspective. This was done to ensure a balance between history and pedagogy. Existing historical data served as the foundation for delving deeper into the history of Fort Willem I, which could then be incorporated into history instruction. Educational concepts were employed to bridge the existing historical narrative to students, notably through the CTL model. Through this technical description, readers can follow the researcher's line of reasoning or conduct similar research on different topics.

## Results and Discussion

### The Historical Significance of Fort Willem I

Fort Willem I has two main aspects of significance: its role as a military logistics hub and the uniqueness of its design, which defied the conventions of European fortresses at the time. Fort Willem I was not merely a haphazardly constructed defensive structure. This fort was a product of colonial anxieties following the Java War (1825–1830). Roberts Niel, in [Pamungkas \(2025\)](#), explains that the Java War—also known as the Diponegoro War—had a massive impact on the Dutch East Indies' finances, which were drained by the costs of the war. The stability of the Dutch East Indies government in Java also began to waver. The construction of Fort Willem I was, essentially, intended to maintain power from within; during the war, the fort was used to concentrate the remaining troops to protect the regime and secure logistical and military routes ([Sari & Triwahana, 2024](#); [Ratih, 2022](#)). Fort Willem I stands as a testament to how rulers utilized a structure to maintain their power. Fort Willem was constructed starting in 1834 and completed in 1845. The fort was named after Willem I to honor the first Dutch King, Frederick Prince of Orange-Nassau, or King Willem I Frederick, who reigned from 1815 to 1840 ([Merrianda, 2018](#)).

Ambarawa was chosen as the construction site due to its strategic location between Semarang, Surakarta, and Magelang. This location was crucial given that in 1940 the Dutch East Indies held power in Central Java and required easy access to govern the region (Harjanti, 2016). Ambarawa's location on a high plateau, surrounded by mountains, made it ideal for defense. Fort Willem I was built on the orders of General Johannes van Den Bosch to anticipate an attack by the British ([Sekundiana, et al., 2023](#)). Additionally, the fort's construction was planned as early

as the 19th century to connect the Semarang-Solo region with the Mataram Kingdom ([Merrianda, 2018](#)). This plan was also in line with the construction of Willem I Station (now Ambarawa Station-Indonesian Railway Museum) in 1873. It is therefore clear that the construction of Fort Willem I was of great importance and necessity at that time.



Figure 1. A 1905 map showing Fort Willem I, with a railway line running through it  
Source: ubl.webattach.nl



Figure 2. Willem I Station between 1890 and 1906  
Source: digitalcollections.universiteitleiden.nl (1906)



Figure 3. A group of KNIL battalions at Fort Willem I (circa 1900)  
Source: digitalcollections.universiteitleiden.nl (1900)

From 1853 to 1927, Fort Willem I served as a military barracks for the KNIL (Royal Dutch East Indies Army). The KNIL unit stationed in Ambarawa was integrated with KNIL battalions in Magelang, Yogyakarta, and Semarang via the railway ([Merrianda, 2018](#)). The fort served as a logistics warehouse and a troop assembly point. In the event of an uprising, Ambarawa supplied

military needs throughout Central Java. This was supported by the construction of a railway line connecting Ambarawa and Kedungjati. Willem I Station in Ambarawa facilitated the transport of logistics and military supplies (weapons and food) from the fort to Magelang and vice versa (Sukandar in [Azzahra & Maziyah, 2023](#)).

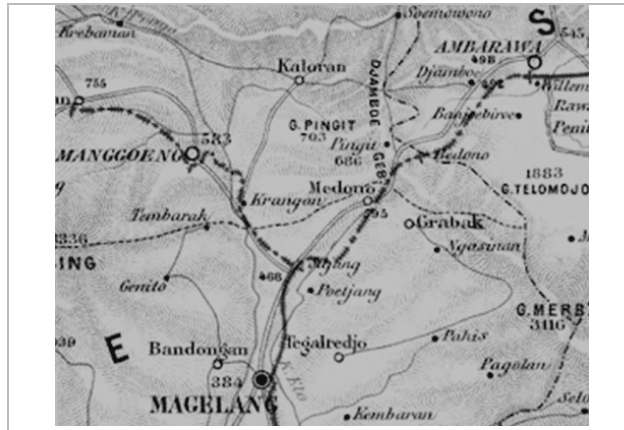


Figure 4. 1902 Map—Ambarawa–Magelang Railway Line  
Source: ubl.webattach.nl

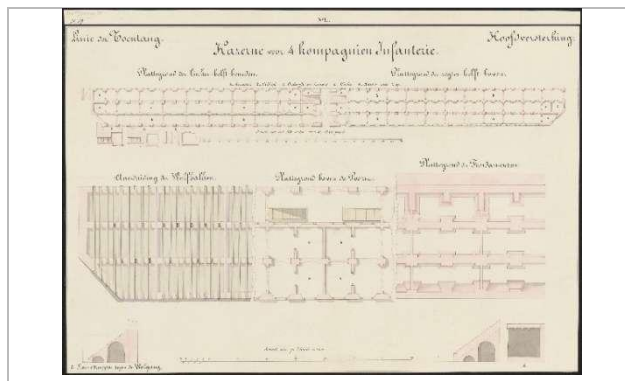


Figure 5. Layout of barracks for 4 infantry companies  
Source: nationaalarchief.nl

[Harjanti \(2016\)](#) explains that during the Japanese occupation, Fort Willem I served as the NICA military headquarters. Then, in 1945, it was captured by the TKR and turned into a military headquarters; it was also used for some time to defend British forces. Every ruling power coveted Ambarawa. This demonstrates that Ambarawa played a crucial role in the history of Indonesia’s struggle for independence. The Battle of Ambarawa stands as tangible evidence that this region was fiercely contested, leading to bloodshed. Following 1965, portions of Fort Willem I were repurposed as a Class IIA Correctional Facility, a function it maintains to this day, while the remaining structures have remained derelict until 2023.

While some structures lay abandoned, several studies have recommended that revitalization and repairs be carried out immediately ([Sekundiana, et al., 2023](#); [Harjanti, 2016](#)). Natural deterioration caused by overgrown vegetation and acts of vandalism posed a threat to the structures’ existence at the time. However, this “original” condition preserves a strong sense of historical authenticity. These structures constitute a national asset that must be preserved.

Work on the revitalization of Fort Willem I began in 2023. The project is being carried out by the Ministry of Public Works and the Central Java Office of the Agency for Development Planning, Infrastructure, and Spatial Planning (BPBPK). This revitalization is in accordance with Semarang Regency Regional Regulation No. 6 of 2023 concerning the 2023–2043 Semarang Regency Spatial Plan, which designates Willem I Fort in Ambarawa District as part of the

regency's spatial planning. This step is highly appropriate, given that Willem I Fort is a Dutch East Indies heritage site where more than 50% of its structure remains original and reflects its original form. The revitalization work took two years to complete. On November 17, 2025, Willem I Fort was officially inaugurated and opened to the public. The fort is now accessible to the general public at an affordable admission fee. Its magnificent architecture can be appreciated and utilized for educational and recreational purposes.

An analysis of the history of Fort Willem I alone is not sufficient. The physical revitalization that has already been carried out can be continued by transforming the fort into an Open History Laboratory. The architecture of Fort Willem I serves as a "visual textbook." The fort was constructed using complex architectural designs that are highly characteristic of European-style defensive structures ([Nurmala & Arafat, 2024](#)). Students can not only view the old building but are also encouraged to engage in visual deconstruction. They can observe the large windows and high ceilings. Through direct visualization, students can understand how colonial architects adapted to the geographical conditions of Ambarawa.

The concept of an "Open History Laboratory" can serve as a variation in history education. While classroom settings may be limited in visualizing historical material, Fort Willem I can serve as a tangible, "hands-on" resource. Students can analyze, draw conclusions, and reflect on past events through the physical structure of the historic building. This teaches us that history is not just about war, but about how humans strive to carry on with their lives by adapting to their environment ([Damayanti & Supriyanto, 2024](#); [Heryati, 2017](#)). The use of exposed red brick is a hallmark of 18th- and 19th-century Indische Empire Style architecture, which involved a large number of indigenous laborers ([Sekundiana, et al., 2023](#)). The construction required no fewer than 1,200 workers brought in from Temanggung to perform compulsory labor (*hereendiensten*) ([Merrianda, 2018](#)).

Knowledge about indigenous laborers is crucial for critical historical learning. The suffering behind the grandeur of Fort Willem I can be explored through an open history laboratory. Students can be guided to reflect on the efforts of the common people who worked to build the colonizers' fort. They can develop a critical awareness of the injustices of the Dutch East Indies era. The connection between Fort Willem I and Willem I Station presents a historical opportunity that can be leveraged in history education. In an open history laboratory, teachers can design a coherent learning sequence: how trains delivered supplies to the fort, and how the fort secured those communication and transportation routes. This approach shifts students' perspective from viewing objects in isolation to a systemic understanding of how a region (Ambarawa) was designed as a military base during the colonial era. The connection between Fort Willem I and Willem I Station symbolizes modernity in Java. It signifies the technological advancements brought by the colonizers for the purpose of exploitation. Students can also analyze both sites to understand that infrastructure always "serves" those in power. Such learning fosters higher-order thinking skills as students must synthesize data gathered in the field.

Revitalization is often limited to "cosmetic improvements" or mere "aesthetics" for the sake of tourism. Debates over the revitalization of a building often become a never-ending issue. The revitalized Willem I Fort can be utilized more fully—not merely for aesthetic purposes. This study emphasizes that there must be room for historical inquiry within it. Instead of focusing solely on physical repairs, revitalization should be maximized by transforming the spaces within the fort into thematic galleries that explain the original functions of those rooms (for example, an armory, a supply warehouse, or an officers' quarters). Thematic galleries can include replicas or dioramas to depict conditions from that era. This encourages students to ask questions and make further observations. Information labels should be designed to stimulate visitors intellectually and spark critical thinking.

The use of technology can also support these functions. Placing QR codes at strategic points within the fort can help students delve deeper into their knowledge of Fort Willem I. Displaying archival photographs or original maps of the fort allows students to directly compare "past and

present” conditions. The use of maps in history education can provide in-depth knowledge regarding the layout of a location, its geographical conditions, and spatial changes that can shape historical development ([Warsani & Syahputra, 2025](#)).

Fort Willem I is, in theory, a relic of colonial oppression. However, it serves as an educational resource that can be practically utilized to foster historical awareness. Historical awareness can emerge when students take pride in the presence of historical buildings in their surroundings. Thus, it can be said that they can also understand the subject matter through local history ([Syahputra, et al., 2021](#)).

Utilizing this building as an open-air laboratory enables the application of the Historical Thinking method. Students are encouraged to ask: “Why was this fort built without a moat?” or “How did the indigenous people feel while working to build such a grand structure?” Similar critical questions will arise when students visit Fort Willem I in person. They can feel the coldness of the stone walls and experience the vastness of the complex. Through the use of this method, students can utilize primary sources to collaborate on data and contextualize events. They can reconstruct the meaning behind the ruins and the grandeur of Fort Willem I. The Open History Laboratory will foster a generation that understands the values of history for a better future.

### **Strategy for Utilizing the Results of the Revitalization of Fort Willem I as an Open-Air History Museum**

The revitalization of Fort Willem I has brought significant improvements to the building’s accessibility and structural safety. This project is not merely a physical renovation of the building, but also a preservation of the nation’s collective memory. Prior to the revitalization, the fort was in a fragile condition and at risk of collapse in several areas. The physical restoration adhered to cultural heritage preservation principles, retaining the original materials as much as possible. This ensures the building serves as a valid educational tool, as its authenticity is guaranteed.

The first aspect visible following the revitalization is spatial recovery. Several rooms that were previously damaged by age and overgrown with wild vegetation have been restored. This allows students to safely explore every corner of the building. With the restoration of these spaces, visitor capacity can be increased. These spaces can provide a substantial volume for reconstructing students’ historical imagination. A clear difference in the building’s condition before and after revitalization can be seen in the image.



Figure 6. The condition of Willem I Fort before its revitalization.  
Source: [jatengprov.go.id](http://jatengprov.go.id) (2020)



Figure 7. Fort Willem I after its revitalization.  
Source: [instagram.com/wisnudewa69](https://www.instagram.com/wisnudewa69) (2026)

The building's restoration is clearly visible. Its neat and clean condition attracts many visitors who come to see this remnant of the Dutch East Indies era. The site is always bustling with visitors every day. Fort Willem I is now another historical vacation destination in Ambarawa, alongside the Indonesian Railway Museum. The high level of visitor enthusiasm can be leveraged as an educational opportunity. Visitors can be guided to gain a deeper understanding of its historical significance, ensuring the fort serves a purpose beyond merely serving as a photo backdrop. This revitalization not only creates a "visual appeal" but also a strong "intellectual appeal."

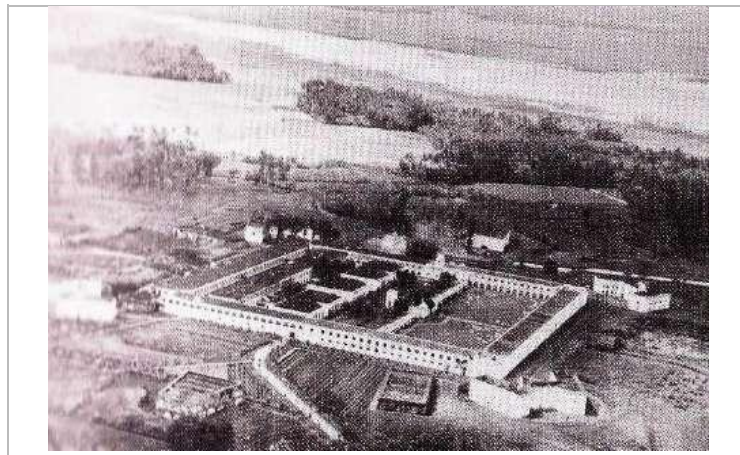


Figure 8. Aerial view of Fort Willem I circa 1927  
Source: Ministry of Education and Culture of the Republic of Indonesia (2012)



Figure 9. Aerial view of Fort Willem I around 2026  
Source: [goodnewsfromindonesia.id](https://www.goodnewsfromindonesia.id) (2026)

The second phase of the revitalization involves improving the pedestrian paths to make them more organized. These paths can serve as a “chronological trail” for learning history. Before the revitalization, the pedestrian paths were overgrown with weeds, blocking access to the fort for exploration. After the revitalization, which utilized paving blocks, the paths appear neater, allowing visitors to comfortably explore every part of the structure. This path connects different parts of the fort to create a logical narrative of the journey. In the context of a history laboratory, this path serves as a learning route that guides students in understanding the fort’s evolution over time. The disability-accessible path ensures that this history laboratory is safe and inclusive for people of all backgrounds.



Figure 10. The pedestrian path before revitalization  
Source: [jatengprov.go.id](http://jatengprov.go.id) (2020)



Figure 11. The pedestrian path after revitalization  
Source: [instagram.com/wisnudewa69](https://www.instagram.com/wisnudewa69) (2026)

The third component of the revitalization is the provision of supporting facilities. There are several spaces occupied by food and beverage tenants, as well as enclosed spaces that have been revitalized so they can be used for discussions, workshops, and contemporary exhibitions. The presence of supporting facilities can enhance student comfort during field-based learning, which typically takes a long time. Additionally, the availability of contemporary exhibition spaces facilitates dynamic information exchange. Well-designed discussion rooms can be used for briefing sessions before observations begin or reflection sessions after observations conclude. Commercial and educational needs can synergize to create a sustainable ecosystem for the future.



Figure 12. Use of space for MSMEs  
Source: Martha Herninda's personal documents (2026)



Figure 13. One of the fortress niches converted into a café  
Source: [instagram.com/wisnudewa69](https://www.instagram.com/wisnudewa69) (2026)

The data indicates that Fort Willem I has sufficient space to accommodate various historical laboratory activities without interfering with the building's other functions, such as the area still used for Ambarawa Prison II. This can serve as a basis for designing a utilization strategy. Students can be divided into small groups that spread out across several locations without crowding. Students can understand that a historic building serves dual purposes and continues to adapt to the ever-changing needs of the times.

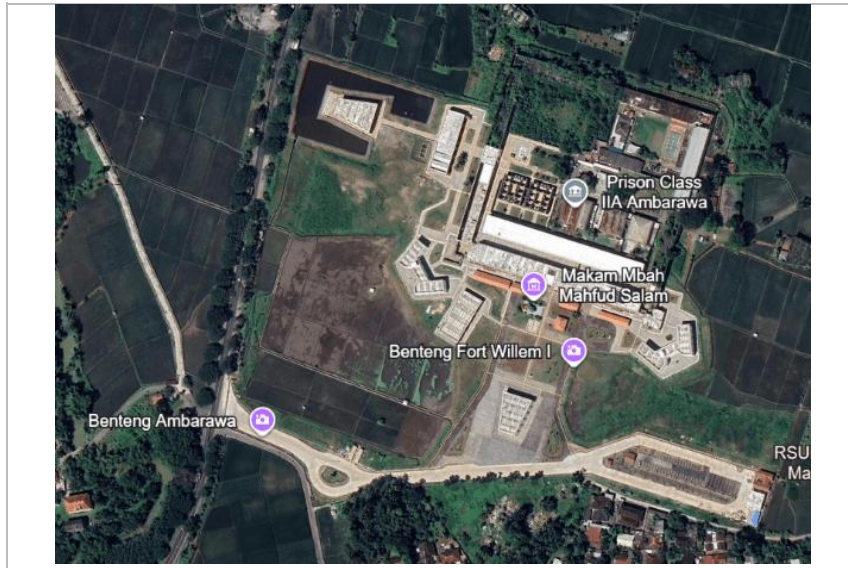


Figure 14. Aerial view of Fort Willem I and Ambarawa Prison II  
Source: earth.google.com (2026)

The revitalization of Fort Willem I has opened up significant opportunities and potential to transform this cultural heritage site into an open-air history laboratory. This transformation serves not only as a tourist attraction but also as a dynamic, participatory, and contextually relevant learning space that meets the educational needs of the 21st century. Structural repairs, space restoration, the redesign of pedestrian paths, and the provision of public facilities have made the fort safer and enable students to engage in direct historical exploration.

From a historical pedagogy perspective, this is crucial because students are no longer merely reading historical narratives from textbooks but are directly engaging with primary sources such as buildings, spaces, artifacts, and authentic colonial historical landscapes. [Umam \(2025\)](#) emphasizes that open-air history laboratories are a form of source-based learning that allows students to conduct real historical investigations through the environment, artifacts, and local narratives.

The use of Fort Willem I as an open-air history laboratory is also relevant to the concept of a “living laboratory” in modern heritage studies. [Naya et al. \(2025\)](#) explain that heritage buildings can be developed into living learning spaces that integrate empirical experiences, digital technology, community engagement, and educational innovation in a sustainable manner. Thus, the revitalization of the fort does not stop at mere physical preservation but also becomes a process of activating historical spaces so they can be used as dynamic and reflective learning media.

In its implementation within contextual history education, Fort Willem I can be divided into several inquiry-based educational zones to help students more easily grasp the focus of historical study in a systematic and in-depth manner. This zoning is crucial because learning history at the site cannot be limited to general visits; instead, it must be structured within a learning experience that has a clear investigative direction and defined historical thinking objectives, as outlined below:

- 1) Architecture and Technology Zone

In this zone, students can explore construction techniques using brick, iron, and wood without modern cement. Drainage systems from the past can also be studied here. Students can be guided to analyze why 19th-century buildings used large, sturdy bricks, and how curved structural technology could support the building’s immense weight. This integrates historical learning with aspects of science and technology.

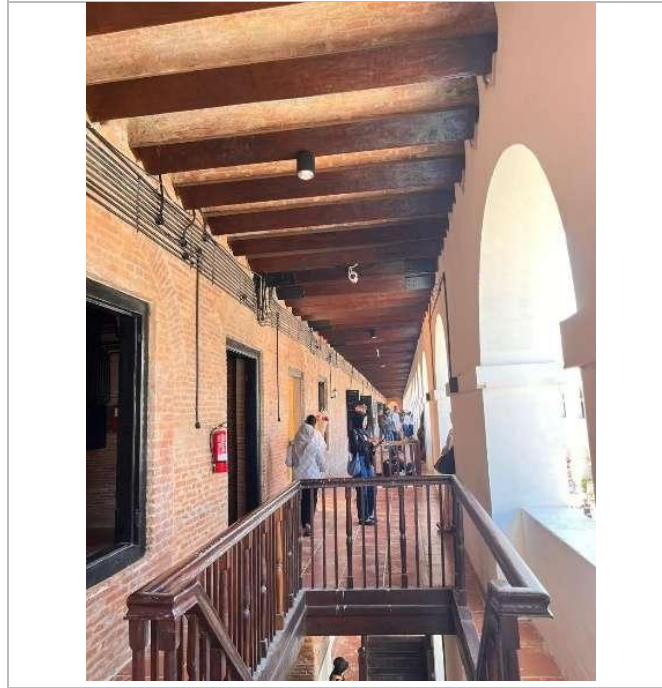


Figure 15. A combination of brick and wood in a building  
Source: Martha Herninda's personal collection (2026)

2) Military Zone (Barracks)

In this space, students can reconstruct the daily lives of soldiers, rank hierarchies, and social interactions within the fortress. They can observe the remnants of soldiers' sleeping quarters and compare them with officers' quarters, which directly reflect the colonial military's social hierarchy of that era.

Specifically for this zone, learning can be combined with historical empathy and role-playing. Students can simulate the life of a soldier, read colonial archives, analyze military spatial arrangements, or discuss how the colonial system operated through military institutions. Such an approach is important because history becomes more meaningful when students are able to understand the human dimension of the past, rather than merely memorizing chronology.

3) Conflict and Diplomacy Zone

The gate and watchtower can be part of this zone. This is intended to help students focus on Ambarawa's position within the colonial geopolitical landscape. In this zone, students can see Ambarawa's role as a key hub for logistics distribution and a strategically positioned fortress for securing the railway line.

Additionally, students can be guided to understand that historical buildings do not stand in isolation but are part of global political dynamics and international colonialism. Through the analysis of old maps, colonial aerial photographs, military archives, and transportation routes, students can see how space was used as an instrument of power. This approach fosters a rebranding effect, enabling local historical sites to possess a narrative power capable of explaining political transitions, power struggles, and social changes within their contextual framework ([Umam, 2025](#)).

A second strategy that can be implemented is contextual teaching and learning (CTL). CTL is highly relevant in site-based history learning because it bridges the gap between abstract historical narratives and tangible material evidence, enabling students to construct their understanding through direct interaction with cultural heritage sites ([Sitorus et al., 2026](#); [Rismawan et al., 2026](#)). This approach is rooted in constructivist learning theory, in which knowledge is actively constructed through students' interaction with their surroundings. When

bringing students to Fort Willem I, they do not merely encounter empirical material evidence but are also engaged in cognitive processes that foster meaningful historical analysis, interpretation, and reflection. The CTL learning sequence at Fort Willem I can be described through the following three operational steps, in which each activity is designed to foster specific cognitive processes leading to the achievement of historical thinking:

1) Observation

Observation activities are not merely limited to examining the physical characteristics of a building, but are aimed at interpreting material evidence as a primary historical source. Students are encouraged to analyze the texture of red bricks, colonial drainage systems, and traces of structural damage as entry points for drawing conclusions about the building's function, chronology, and socio-political context. This process fosters historical reasoning, the ability to draw historical conclusions based on directly observed evidence.

2) Historical Empathy

Historical empathy is developed through evidence-based role-playing, where students reconstruct the perspectives of both colonial and indigenous actors based on contextual information gathered directly from the site, rather than mere imagination. For example, through an analysis of the layout of soldiers' barracks and officers' quarters studied in the Military Zone, students can discuss how the colonial hierarchy functioned in daily life. This approach fosters an understanding of multiple perspectives as the foundation for scientifically grounded historical empathy.

3) Problem-Based Learning

Students are given investigative questions whose answers can only be found through direct analysis at the site. For example: "Why was Fort Willem I built adjacent to the Ambarawa–Kedungjati railway line, and how does this spatial relationship reflect colonial military defense strategies?" Questions like this encourage students to connect the spatial analysis of the fort with colonial military strategies, making the thinking process site-based and impossible to complete simply by reading a textbook.

The third strategy is digitization through electronic devices. In historic buildings, it is not uncommon to find sections that have collapsed; therefore, the approach that can be taken to utilize them—provided that the innovations introduced focus on encouraging students to visit the site rather than simply digitizing the site—is as follows ([Hakim et al., 2024](#)). Within this framework, technology serves as an interpretive layer that enriches, rather than replaces, the authentic experience at the historical site; the innovations that can be implemented include:

1) Placing QR codes at several strategic points resulting from the revitalization.

Each QR code provides access to primary historical sources, such as colonial document archives, historical aerial photographs, original fortress maps, and 3D reconstruction videos. In this context, QR codes serve not merely as technical tools but as a starting point for learning that enables students to critically analyze historical evidence directly on-site (in situ). Thus, an open-air history laboratory can facilitate real historical investigation through students' interaction with primary sources in their authentic environment.

2) Creating augmented reality (AR)

This technology supports immersive learning by allowing students to visualize building structures that are no longer physically visible, as well as to compare temporal layers between past conditions and the revitalized physical state. Through this kind of spatial-temporal reconstruction, students are facilitated in understanding historical changes more deeply, not merely as an abstract narrative, but as a cognitive experience embedded within a space.

The fourth strategy is collaboration between schools and the community. The history laboratory can continue to operate by involving local stakeholders as well as the local cultural and

economic ecosystems. The existence of historic buildings must have a tangible impact on the local educational community. Some steps that can be taken include:

- 1) The first collaboration is a partnership between the managers of Fort Willem I and the History Teachers' Working Group (MGMP). This partnership serves to bridge the educational potential of the site with the requirements of the current curriculum. Specifically, this collaboration can produce site-based teaching modules designed in accordance with the learning outcomes of the Merdeka Curriculum, so that visits to Fort Willem I are not incidental but are integrated into a systematic and measurable learning plan.
- 2) Collaboration with content creators. History content creators can serve as a bridge between the younger generation's digital culture and the hands-on history learning experience at Fort Willem I. However, this role should be directed toward increasing students' interest in field exploration, not replacing the physical site with media consumption alone. In practice, content creators are engaged as partners to produce historical teaser videos of Fort Willem I that spark curiosity before the visit, storytelling-based QR codes at specific points within the fort that are only accessible on-site, documentation of students' field observation processes as promotional material, and live historical tours conducted with the local history community.
- 3) Collaboration with Local History Enthusiast Communities. Local history communities hold a strategic position in establishing an open history laboratory because they understand local narratives, the history of the surrounding community, and the social dynamics of the site in a more contextual manner. The presence of these communities is also crucial for connecting school learning with the social realities surrounding the fort. This collaboration positions the community as facilitators for historical tours, field observation guides, cultural heritage interpretation trainers, and organizers of history festivals and reenactments.  
Their involvement will help students understand that history is not merely academic material, but rather a living part of society that is continuously passed down. [Naya et al. \(2025\)](#) and [Umam \(2025\)](#) explain that site-based history laboratories will be more effective if they involve the local community as part of the ecosystem of historical interpretation and preservation. This collaboration can also strengthen the community's sense of belonging to Fort Willem I, so that the preservation of cultural heritage becomes not just the government's responsibility, but a shared social movement.

The success of utilizing Fort Willem I as an open-air history laboratory depends on striking a balance between preserving the building's authenticity and facilitating contextual learning. Revitalization efforts must not focus solely on aesthetics, as this could undermine the site's historical value; they must also prioritize conservation to ensure that educational activities do not damage the cultural heritage site ([Ummah & Rahmaillah, 2024](#)). Therefore, strategies such as educational zoning, inquiry-based learning, interpretive digitization, and collaboration with the community and the heritage creative industry are considered appropriate because they can transform the fort into a living laboratory that connects hands-on learning experiences, technology, and community engagement ([Naya et al., 2025](#)). Furthermore, the use of immersive technologies such as QR codes and augmented reality has proven to enhance student engagement without replacing hands-on learning experiences at historical sites ([Lin et al., 2024](#); [Rismawan et al., 2026](#)). Consequently, Fort Willem I can evolve into a dynamic, participatory, and relevant source of historical learning for today's generation.

## Conclusion

Fort Willem I in Ambarawa is not merely a colonial relic, but a complex historical site that holds value and significance for historical education. As a 19th-century military logistics hub integrated with the railway system, the fort bears witness to the dynamics of power and spatial

planning in Central Java. The 2025 physical revitalization initiative marks a crucial turning point in preserving the building's original structure while providing safe and comfortable infrastructure for visitors.

However, the success of this revitalization must not be limited to mere tourism aesthetics. Transforming Fort Willem I into an Open History Laboratory is a strategic step to reposition this site as a "visual textbook." Through a measured strategy, history education is shifted from rote memorization to a process of deep inquiry encompassing four main pillars: Inquiry-Based Educational Zoning, Implementation of Contextual Teaching and Learning (CTL), Knowledge Digitization, and Strategic Collaboration.

Overall, this article aims to highlight contributions to history education and history learning based on cultural heritage. Through the ideas presented here, it is hoped that the preservation of Dutch East Indies heritage will not merely be empty rhetoric but can also be utilized in specific areas of history education appropriate to their respective contexts.

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### Conflict of Interest

The author(s) declare no conflict of interest. If a conflict exists, it must be disclosed clearly.

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