Developing Living History Model Assisted by Digital History Textbooks in History Learning to Improve Students' Historical Empathy

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Abstract

This study develops a living history model, supported by digital history textbooks, to enhance students' historical empathy in history learning, aligning with the characteristics of Generation Z. Historical empathy refers to the ability to understand and reflect on differences in historical perspectives in depth. This study aims to design a living history model supported by digital history textbooks to enhance students' historical empathy and to evaluate its effectiveness. This study employs a Research and Development (R&D) approach, utilizing the Analyze, Design, Develop, Implement, and Evaluate (ADDIE) model. The total number of participants in the research was 471 people. Data collection techniques include observation, interviews, and tests. Data analysis utilizes interactive data analysis, Aiken's V, the Partial Credit Model, and the Generalized Linear Model. The results show that the living history model with the Technological Pedagogical Content Knowledge (TPACK) approach consists of two phases: the planning phase and the core activity phase. With an effect size of 88%, the implementation of this model has a significant impact on students' historical empathy. This finding contributes to innovation in history learning, particularly in developing deeper historical empathy through digital textbooks and pedagogy.

Keywords: *Digital History Textbooks, Historical Empathy, History Education, Living History Model, TPACK.*

Introduction

In the 21st century, history education is challenged to go beyond the transmission of chronological facts. It must cultivate skills such as critical thinking, ethical reasoning, and the ability to understand diverse perspectives—what is increasingly referred to as historical empathy. These objectives are particularly pressing in Indonesia, where history learning often remains textbook-based, dominated by nationalistic narratives, and detached from students' everyday experiences. Generation Z learners, who are immersed in digital media and multitasking environments, require new strategies to engage with history. The integration of digital history textbooks with innovative

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pedagogies such as Living History offers an opportunity to enhance both cognitive understanding and emotional connection to the past. Instead of memorizing dates and events, students can examine historical dilemmas, visualize past lives, and connect emotionally with historical figures. In this context, historical empathy is essential. Defined by (Endacott & Brooks, 2018) as a combination of contextual thinking, perspective-taking, and affective engagement, it allows students to interpret historical actions without applying present-day judgments. This skill not only enriches historical understanding but also fosters respect, tolerance, and ethical awareness in a pluralistic society.

One such issue is student misbehavior, including bullying, which remains a widespread concern. In Indonesia, for example, over 26,000 bullying cases were reported in 2018 (Noboru et al., 2021). Issues such as school bullying—which remains widespread in Indonesian schools—highlight the importance of empathy in education. While empathy education alone cannot resolve social problems, integrating historical empathy into classroom instruction can help foster more reflective and respectful learning environments (Johander et al., 2022). Empathy is not only vital for understanding the past but also for addressing current challenges in education. However, most instructional models in history education still rely on printed texts and passive learning methods, offering limited opportunities for emotional engagement. Although some programs include field trips or museum visits, these remain restricted in scope and accessibility. Digital textbooks, enhanced with multimedia and supported by pedagogical frameworks such as TPACK, can help close this gap by bringing history to life within the classroom.

This study addresses that gap by developing a Living History instructional model supported by digital history textbooks and structured around the Technological Pedagogical Content Knowledge (TPACK) framework. The model is designed to engage students through rich content, interactive media, and empathy-building learning tasks, aiming to enhance their historical understanding and foster a personal connection to the past. Despite the potential of such approaches, there is a lack of empirical research in the Indonesian context exploring how digital tools and effective pedagogy can be effectively integrated to support historical empathy. This study aims to fill that gap.

In the digital age, history education encounters both challenges and opportunities, particularly in cultivating students' historical empathy through more interaction. Digital history textbooks, when paired with pedagogical innovation, present new ways to bring historical events, perspectives, and emotions closer to students (Kim & Jung, 2010; Lee et al., 2023). Historical empathy—understood

as the ability to comprehend and emotionally connect with people from the past—has become an essential educational goal, especially for Generation Z students who are deeply immersed in technology (Bartelds et al., 2020; Endacott & Brooks, 2018). Strengthening historical empathy in students is, therefore, both a pedagogical and social imperative (Ross et al., 2023).

In this context, history education plays a critical role in developing students' empathetic abilities by enabling them to understand multiple perspectives, emotions, and experiences from the past. Historical empathy is not merely a cognitive skill but also an affective disposition, requiring students to interpret historical contexts, grasp the motivations of historical actors, and connect these to present-day issues (Karn, 2022). However, traditional approaches to history teaching often fall short in fostering emotional or critical engagement, as they rely heavily on textbook memorization and singular national narratives (Clark et al., 2024; Eggink, 2018).

Furthermore, although various efforts have been made to cultivate empathy through educational programs, most approaches remain confined to general character education. They are rarely integrated into specific subject areas such as history. Existing studies have examined historical empathy through outdoor activities or visits to heritage sites, yet the use of digital history textbooks within empathy-based pedagogy remains underexplored, particularly in Indonesian secondary school settings (Attisano, 2021; Azmi, 2017).

This study addresses this gap by developing a Living History learning model supported by digital history textbooks and framed within the TPACK approach. The model aims to engage students in immersive, emotionally resonant, and historically accurate learning experiences using digital technology. The integration of TPACK ensures the alignment of content (history), pedagogy (Living History), and technology (digital textbooks, video, VR) to promote deeper historical understanding and empathy (García-Martínez et al., 2024; Zhubi & Ismajli, 2022).

Despite the recognized importance of historical empathy in fostering critical and empathetic thinking, particularly among Generation Z learners, limited research has examined how technology—especially digital history textbooks—can be systematically integrated into instructional models to support this competency. Previous studies have frequently relied on traditional or extracurricular methods without incorporating digital tools that align with students' learning preferences. As a result, there is a need for an innovative instructional design that combines pedagogical strategy, content knowledge, and technology to enhance students' historical empathy within the classroom setting. To map current trends in Living History and historical

empathy research, a bibliometric analysis (2020–2025) was conducted using Publish or Perish and visualized via VOSviewer. The results highlight key thematic clusters across both fields, as illustrated in Figure 1 and Figure 2.
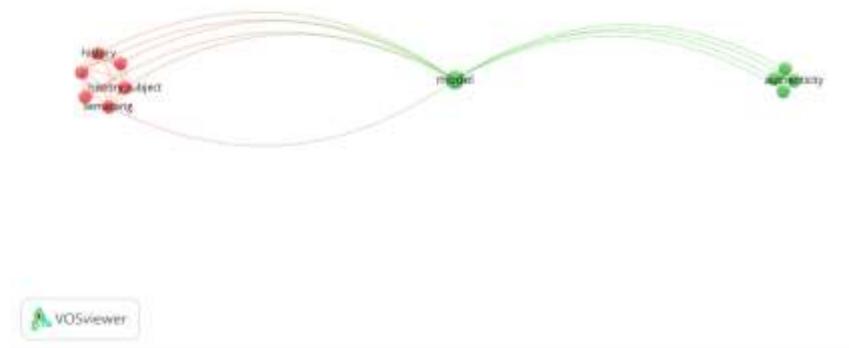
Figure 1. Bibliometric Model Living History
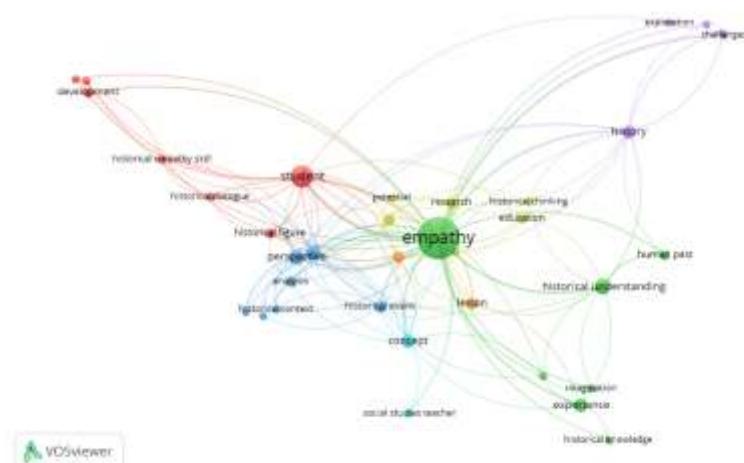
Figure 2. Bibliometric Historical Empathy

Literature Review

Model Living History with TPACK Approach

Living history is a learning model that utilizes historical sources from students' surroundings. It often involves field trips, as specific historical sources are challenging to bring into the classroom.

This model has been applied in history education by linking lessons to historical sites familiar to students. Students can experience living history by visiting museums and archaeological sites or attending drama and film performances (Attisano, 2021). However, bringing living history into the classroom remains challenging, as it requires contextualization through historical evidence (Azmi, 2017; Chaves-Guerrero et al., 2024; Chimbunde et al., 2023). In the current era of technological advancement, living history can be delivered without students physically visiting historical locations or objects. Technology enables past events and sources to be brought into the classroom. Tools such as Augmented Reality (AR), Virtual Reality (VR), and 3D avatars allow for this experience (Geigel et al., 2020). Historical sources that are otherwise distant from students can now be quickly accessed in classroom settings using technology (Barbara, 2022). TPACK is a framework that outlines the integration of three key components in the learning process: technology, pedagogy, and content. Technology refers to the use of various tools and devices in teaching and learning; pedagogy involves effective methods, strategies, and techniques; and content relates to the curriculum being delivered (Magocha et al., 2025; Mishra & Koehler, 2006; Orakova et al., 2024). Integrating technology into education is crucial in today's digital era (Cabezas-González et al., 2024; Mlangeni & Seyama-Mokhaneli, 2024). TPACK guides educators in designing innovative instruction by combining these elements to create more engaging and interactive learning experiences. It also helps address students' diverse learning styles, enabling educators to select appropriate technologies to meet individual needs. Moreover, effective use of technology can improve students' understanding of the subject matter (García-Martínez et al., 2024; Hamakali & Josua, 2023; Zhubi & Ismajli, 2022). In the context of history education, technology can help create a more enjoyable learning environment. History is often seen as dull due to its reliance on repetitive texts (Eggink, 2018). However, with the advent of technology, students can utilize smartphones and other tools to explore and engage with living history.

Digital History Textbook

History learning in Indonesia relies heavily on textbooks as the primary source of historical content. These textbooks often reflect perspectives on historical events and figures. According to Clark, history textbooks serve as tools for nation-building and are frequently the sole reference in classrooms (Clark et al., 2024). In Indonesia, history textbooks are available in both print and digital formats. Printed versions are produced and distributed to schools, while digital versions can

be accessed online via gadgets by students and teachers. These textbooks typically focus on written historical narratives. Research on history textbooks has so far concentrated mainly on their content, with limited attention given to how teachers interpret and use them. As professionals, history teachers can integrate instructional models with textbooks to fulfill specific learning goals. Textbooks need not be rigid sources; teachers can reframe narratives to suit learning objectives, supported by additional historical materials (Lee et al., 2023; Darmawan et al., 2018). Digital textbooks offer several advantages over printed textbooks. They can enhance students' metacognitive skills, self-directed learning, and overall engagement (Kim & Jung, 2010; Lee et al., 2023). By incorporating interactive content such as video, virtual reality, and augmented reality, digital textbooks provide immersive historical experiences that support both cognitive and affective learning (Barbara, 2022; Eggink, 2018; Geigel et al., 2020). The transition from printed to digital history textbooks represents more than a shift in format; it offers an opportunity to transform how students engage with the past. Through multimedia tools—such as videos, interactive timelines, and virtual reality—digital textbooks enable students to visualize historical events and form deeper emotional connections with historical figures. These tools enhance both understanding and engagement, which are essential for developing historical empathy. As such, digital history textbooks serve as an effective medium for fostering students' historical empathy in ways traditional resources often cannot.

Historical Empathy

Historical empathy is a key concept in modern history education, aimed at developing students' ability to understand the experiences, motivations, and emotions of people in the past. Endacott and Brooks (2018) define historical empathy as a process comprising three interrelated components: historical contextualization, perspective-taking, and affective connection. Contextualization involves situating historical events within their correct temporal and cultural settings. Perspective-taking requires students to interpret the motives and decisions of historical figures using available evidence. The affective connection allows students to engage emotionally with the experiences of individuals or groups from the past without imposing present-day moral judgments. Bartelds et al. (2020) expand this model into five analytical dimensions: (1) evidence and contextualization, (2) informed historical imagination, (3) perspective-taking, (4) ethical judgment, and (5) caring. This framework emphasizes that historical empathy is not about

indiscriminate sympathy but about making informed, imaginative, and ethically aware interpretations grounded in historical sources. In practice, students are encouraged to critically examine artifacts, documents, and narratives and to construct historically plausible interpretations of past events and lives. Historical empathy is both cognitive and affective. Cognitively, it involves analytical skills such as sourcing, corroborating, and contextualizing historical information. Effectively, it requires a willingness to emotionally engage with historical actors—even those whose values may differ from our own (Karn, 2022). This dual nature makes historical empathy especially effective in challenging simplistic, binary views of history and in fostering deeper critical thinking. In the classroom context, fostering historical empathy enables students to view history not simply as a sequence of facts but as a collection of human experiences shaped by culture, power, struggle, and agency. It encourages an appreciation of the complexity of the past and the recognition of others' humanity, which can, in turn, promote tolerance and reduce bias (Frentzel-Beyme & Krämer, 2020; Sutimin, 2019). These qualities are essential for addressing current educational challenges, including the development of empathy to mitigate negative behaviors such as bullying (Johander et al., 2022; R. Raposo et al., 2023). In this study, historical empathy is the central learning outcome of the Living History model. It is operationalized through a set of indicators—emotional understanding, historical imagination, perspective comparison, and critical reflection—which are integrated into both the instructional design and the assessment tools. This study aims to develop and evaluate a Living History instructional model, supported by digital history textbooks and framed within the TPACK approach, to improve students' historical empathy in history education. Specifically, the research seeks to (1) design a Living History learning model that integrates historical content, pedagogy, and technology in line with the TPACK framework and (2) evaluate the effectiveness of this model in enhancing students' historical empathy in classroom settings. The research questions guiding this study are: (1) How can a Living History model, integrated with digital history textbooks and the TPACK framework, be designed to enhance historical empathy? (2) To what extent is the Living History model effective in improving students' historical empathy compared to conventional methods?

Method

Research Design

This study employed a research and development (R&D) design, guided by the ADDIE model, to develop an instructional model. The aim was to enhance historical empathy through a Living History approach supported by digital history textbooks and framed within the TPACK framework (Zou et al., 2023). The research utilized both qualitative and quantitative methods. The research procedures followed the ADDIE model, which includes five stages: Analysis, Design, Development, Implementation, and Evaluation. This model was chosen for its structured yet adaptable approach, making it well-suited to the development and validation of instructional innovations in education. Each phase in the study was performed systematically to ensure the instructional model's relevance, usability, and effectiveness. Figure 3 illustrates the overall research flow based on the ADDIE framework. The research followed the ADDIE instructional design model, comprising five key stages: Analysis, Design, Development, Implementation, and Evaluation (Zou et al., 2023). The flow of the study is illustrated in Figure 3.
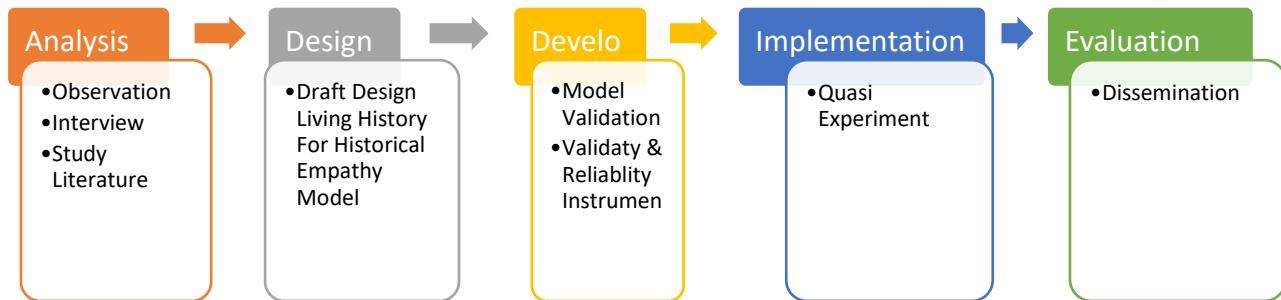

Figure 3. Design ADDIE

Analysis Exploration Stage

In this initial stage, the researchers conducted a needs analysis through (1) a document analysis of existing Indonesian high school history textbooks to identify limitations in engagement, emotional content, and perspective diversity and interviews with two history teachers and five students to explore perceptions of current history learning and the feasibility of integrating empathy-based digital models. (2) a brief literature review focusing on empathy, historical pedagogy, and digital innovation in education. The findings revealed that conventional history textbooks were often overly factual, lacked effective narratives, and did not support the development of empathy. These

insights informed the subsequent design of the instructional model.

Design and Prototyping Stage

Based on the exploration, the prototype of the Living History model was developed, incorporating the five dimensions of historical empathy (Bartelds et al., 2020) and aligned with the TPACK framework. The model included digital textbook drafts with multimedia content, learning scenarios built around empathy-based inquiry tasks, and evaluation rubrics for assessing historical empathy. This prototype underwent expert validation through the Delphi technique, involving two senior history educators, one instructional design expert, and one ICT integration specialist. The experts assessed the model's content, structure, and feasibility using structured validation forms. Their feedback was then used to refine the materials and learning activities prior to implementation.

Development and Revision Stage

Following expert feedback, the prototype was revised. A readability test was conducted with 72 students to assess the clarity and usability of the digital textbook content. Adjustments were made based on student input concerning language, navigation, and interactivity. The final version of the Living History model was then prepared for classroom implementation, combining validated content with teacher-guided empathy-based tasks.

Implementation and Evaluation Stage

In the final phase, the model was tested using a quasi-experimental design involving 108 Grade 11 students, divided into two experimental groups and one control group (36 students per class). Pre- and post-tests on historical empathy were administered. The experimental groups implemented the Living History model with digital resources, while the control group received conventional instruction. Data were analyzed using the General Linear Model (GLM) in SPSS 17 to assess the model's effectiveness. Additional data were collected through classroom observations and student reflection sessions. Instruments and data collection tools included interview guides (Exploration Stage), validation rubrics (Design Stage), observation sheets and test items (Implementation Stage), and historical empathy tests based on 20 indicators (Table 1). Validity and reliability were confirmed using Aiken's V (Table 2) and Rasch Model analysis.

Data analysis involved qualitative data from interviews and observations, which were examined using Miles and Huberman's model—comprising data reduction, data display, and conclusion drawing. Quantitative data from the tests were analyzed using the General Linear Model (GLM), following tests for normality and homogeneity. The effectiveness of the model was determined by comparing the gain scores of historical empathy between the experimental and control groups.

Research Group

This study also involved 250 Grade 11 senior high school students in Bandung for item validation of the historical empathy questions. For the readability test, two class groups comprising 72 students were included. During the experimental phase, three class groups—comprising a total of 108 students—were divided into two experimental classes and one control class, each with 36 students. Additionally, the study engaged two history lecturers, two history teachers, and one doctoral student as expert validators.

Experimental Procedure – Application

The implementation phase, in line with the ADDIE model, consisted of the planning, implementation, and assessment stages. The planning phase involved identifying historical sites near the school, formulating learning objectives, selecting historical sources, and preparing digital history textbooks along with ICT tools. In the implementation phase, teachers introduced historical empathy through visual stimuli (images/videos) of historical events and figures. Students engaged in inquiry-based group activities using digital materials and worksheets, which included online searches, textbook references, and site mapping, followed by class presentations and reflection sessions. In the assessment stage, the researcher used a structured rubric and validated test items, focusing on aspects of historical empathy as outlined in Table 1.

Table 1

Grid of Historical Empathy-Based Questions

No	Aspect	Indicators
1		Contemplation of past events with the present
2	Historical empathy	Make connections between the past and the present
3		Examining present life with the past
4		Instructs to examine the emotions of historical actors

No		Item
5		Inviting students to pay attention to the environment
6		Interpretation of historical actors (thinking, acting, behaving, and making decisions)
7		Narrating the emotions of the perpetrator
8		Narrating the emotional history of groups
9		Narrating various points of view from historical groups
10		Care about historical actors in the past
11		Caring for historical actors who suffered in the past
12		Care about the events that occur
13		Assess the consequences of the thoughts, behaviour, actions, or decisions of historical actors.
14		Assessing past norms and values
15		Understanding the impacts that occur as a result of the attitudes, thoughts, behaviour, actions or decisions of historical actors
16		Predicting the future
17		Reflective
18		Historical Imagination

Data analysis technique for experts validated using Aiken's V to validate the instructional model in Table 2 (Adios, Yulius, & Neta, 2023).

Table 2
Conversion of Aiken's V Assessment

No	Validity Results	Validity Criteria
1	0.80 < V < 1.00	Very High
2	0.60 < V < 0.80	High
3	0.40 < V < 0.20	Enough
4	0.20 < V < 0.40	Low
5	0.00 < V < 0.20	Very Low

Data Collection Tools

Data collection tools included instruments such as interviews with teachers and students, observations during learning activities, documentation of classroom practices, questionnaire for content clarity, pedagogical coherence, and user-friendliness, questionnaire for readability, and historical empathy test items. These test items were developed and validated using Aiken's V and Rasch Model criteria.

Data Analysis Techniques

This study employed both qualitative and quantitative data analysis techniques. Qualitative data were analyzed using Miles and Huberman's interactive model, which includes data reduction, data display, and conclusion drawing. Quantitative data were analyzed using Aiken's V for expert validation, the Partial Credit Model (PCM) and Item Characteristic Curves (ICC) for empirical item validation, the Rasch Model for reliability testing, and ANOVA with the General Linear

Model (GLM) to evaluate effectiveness. Normality and homogeneity tests were conducted as prerequisite analyses.

The effectiveness of the developed model was measured using pre-test and post-test scores of students' historical empathy across experimental and control groups. Statistical analysis using SPSS 17 showed significant improvement in the experimental groups. The instructional model and test instruments received strong empirical and expert validation. Data were analyzed using both qualitative and quantitative methods. Qualitative data, such as observations and interviews, were processed using Miles and Huberman's interactive model. Quantitative analysis consisted of several phases. Instrument validation employed Aiken's V and Rasch Model analysis, examining INFIT and OUTFIT Mean Square (MNSQ) values to determine item fit and reliability. Historical empathy test items were empirically validated using the Partial Credit Model (PCM) and analyzed with QUEST and Parscale programs to generate Item Characteristic Curves (ICC) and Standard Error of Measurement. Reliability was assessed using Rasch-based estimates, with acceptable coefficients above 0.67, as detailed in Table 3. Effectiveness testing used the General Linear Model (GLM), comparing pre-test and post-test scores. ANOVA was conducted in SPSS version 17, following normality and homogeneity tests to ensure the validity of subsequent statistical procedures. These analyses confirmed the strong empirical and expert validation of both the model and the instruments used.

Table 3
Criteria Reliability

Reliability Estimates (*Item Estimate* and *Case estimate*)	Criteria
X>0,94	Excellent
0,91-0,94	Very Good
0,81-0,90	Good
0,67-0,80	Enough
X<0,67	Poor

Instrument Development and Validation

To assess students' historical empathy, test items were developed based on five analytical components adapted from Bartelds et al. (2020): (1) evidence and contextualization, (2) historical

imagination, (3) perspective-taking, (4) ethical judgment, and (5) caring. These indicators were translated into measurable cognitive and affective items, aligned with the learning objectives of the Living History model. The items were reviewed and validated by two history lecturers, two senior history teachers, and a doctoral student using the Aiken's V method. The interpretation of Aiken's V values followed the criteria outlined in Table 2, with items scoring below 0.67 revised or removed. After expert validation, the instrument underwent empirical testing using the Rasch Model, focusing on INFIT and OUTFIT Mean Square (MNSQ) values. Items were deemed acceptable if their MNSQ values fell within the 0.5–1.5 range. Reliability coefficients were also calculated to ensure internal consistency, with a minimum acceptable threshold of 0.67.

Findings

Analysis Exploration Stage

History learning in Senior High Schools (SMA) in Bandung incorporates historical resources from the surrounding environment. Teachers and students make use of reading materials and textbooks available in school libraries, as well as internet sources to support their understanding of historical topics. In addition, teachers adopt alternative resources such as photo documentation, audio recordings, videos, written texts, print media, digital sources, historical figures or witnesses, and recorded interviews.   History teachers in Bandung actively integrate local historical sources into their teaching, as utilizing nearby resources can make lessons more relevant, engaging, and contextual for students (Mbatha & Moreeng, 2024).   For example, teachers may assign students to conduct local historical research around the school area.

Local history helps students understand the historical narratives specific to their own area. It also allows them to observe physical evidence of the past directly. Students show high enthusiasm for local history projects, as activities involving exploration and direct observation of historical sites make history lessons more engaging (Boty et al., 2023; B. K. Kim et al., 2022). Local history within students' environments reinforces the idea that history truly happened—enabling them not only to imagine past events but also to see tangible evidence through local sources. Moreover, students are drawn to learning outside the classroom and gain valuable knowledge about their surroundings. Through project-based learning, they may research the origins of their village

names, which fosters greater interest in local history (Jamiludin & Darnawati, 2022; Pan et al., 2023).

The teacher challenges students to explore their village's local history. History teachers have unconsciously provided an understanding of historical empathy. Teachers can foster historical empathy through student activities by connecting the present and the past using trigger questions or photos and videos. Teachers also use formative assessments with photos/videos from the past to connect the past and present. Another method of historical connection is using past case studies that resemble contemporary issues. Teachers can encourage students to draw analogies between historical events and current situations. Teachers can also assign projects where students research a historical event and find its impact on current life by connecting local history to foster historical empathy (Jamiludin & Darnawati, 2022; Perrotta & Cross, 2024). History teachers use discussion methods on environmental change issues through field studies at local historical sites and local historical research projects. Through this, teachers invite students to be grateful for living in an area with many historical stories. We occasionally ask students to walk around locations that contain historical events. Through environmental concerns, history teachers can create historical empathy (Frentzel-Beyme & Krämer, 2020). History teachers also encourage students to imagine with emotions and visuals using images in videos and stories of historical figures. History teachers ask questions such as 'Imagine you are this figure, living at that time,' and 'How do you feel when facing this difficult situation?'. "How do you feel about the historical figures you are studying? What do you understand about their emotions and experiences?' These questions can stimulate imagination and help students imagine the emotions of historical actors.

History teachers narrate various perspectives in history to instill historical empathy. They invite students to understand different views on historical objects by presenting multiple perspectives on historical events. History teachers always emphasize that there is relativism in history. They also assign students to create short stories or narratives based on the perspectives of historical figures who experienced certain events, focusing on the emotions and visualizations of historical actors to build narratives of various perspectives. These different perspectives help develop valuable historical empathy for students in dealing with societal problems (Kohut, 2020).

Teachers use many historical sources to tell stories about historical actors so students develop historical empathy. History teachers help students gain diverse perspectives from the historical figures studied, allowing students to draw their own conclusions. They also emphasize that

different points of view make historical writing subjective and must be handled wisely by comparing sources to find more objective information (Jarrahi et al., 2023). Students research and analyze the profiles of historical actors, including their backgrounds, values, beliefs, and actions. The case study method of a particular historical event helps students understand how historical actors made decisions and how those decisions influenced events. History is shaped by those in power. Students are reminded not to judge historical actors too harshly, especially those labeled as bad. They must explore various sources from multiple perspectives. Teachers always stress that there is no absolute truth in history. History teachers can also predict the future by emphasizing that historical events do not repeat in the same way. They guide students to see history as a tool to understand the past and prepare for future challenges and opportunities. We encourage students to keep reflecting on their historical knowledge and its potential to shape a better future. History teachers always remind us that history is a science that crosses the journey of time—past, present, and future. The purpose of learning history is to analyze past events in the present and apply their lessons so that we can improve in the future (Miles & Keynes, 2023).

History teachers can foster awareness through historical events linked to daily activities, asking students to imagine if they were born and raised during that time. They also relate historical events to experiences, values, or issues relevant to students' lives today. Students are invited to reflect on how historical events affect them or their society. History teachers aim to build awareness of injustice towards historical actors or groups by encouraging critical thinking about every historical story so students can respond from both positive and negative sides. They also ask students to reflect as if they were historical actors at that time. Concern can grow through reflection on history learning (Huebner, 2022).

Documentaries can depict the lives of figures or groups who experienced injustice to provide a strong visual image. If students cannot find a documentary, they can present the narrative of the oppressed or unjustly treated party in history, highlighting their stories to develop a deeper understanding of the impact of injustice and feel motivated to prevent it in the future. Teachers invite students to follow the development of the times, analyze news or history from figures who did not receive justice, and examine their important roles so students can see both their flaws and their positive contributions (Hanke et al., 2015).

Design and Prototyping Stage

Based on the analysis of interviews and observations in five schools in Bandung, the researcher designed a Living History learning model using the TPACK approach and supported by digital history textbooks to enhance historical empathy. The development process involved compiling history modules by integrating theoretical concepts with findings from interviews and observations in the context of history teaching. The Living History model combines technology with the principles of the TPACK framework. Historical empathy serves as its foundation, as it closely aligns with contemporary issues such as intolerance and school bullying. This study organizes the Living History model in a structured sequence consisting of planning, implementation, and evaluation stages. The planning phase, guided by the TPACK approach and grounded in historical empathy, begins with history teachers identifying historical sites or locations within the school's surroundings that align with curriculum learning outcomes. Teachers also gather supporting media, such as photos, videos, archives, and historical sources related to these sites. The instructional design is student-centered, aiming to foster active, interactive, and engaging learning experiences. Teachers are encouraged to create lessons that allow students to utilize their smartphones for educational purposes. The following table presents the details of the planning phase.

Table 4

Planning Phase

Aspect	Activity
Identification	Identify historical sites, places, events around the school, and learning sources for history.
Formulating Objectives	Formulate learning objectives for history from historical sites, places, and events around the school.
Synchronisation	Synchronisation of Learning Achievements and history in the surrounding environment.
Preparing historical sources	Preparing historical sources in the form of photos, films, or digital documents and digital history textbooks.
Preparing ICT tools	Prepare and check learning tools such as Gadgets, LCD, and Internet Connection.

The next phase is the implementation phase of the learning process. At this stage, history teachers apply the steps of the Living History model, utilizing digital history textbooks and guided by the principles of historical empathy.

Table 5

Implementation Phase

Activity	Description
Introduction	• The teacher prepares the class for lesson. • The teacher opens the lesson with greetings and prayers. • The teacher explains essential competencies, objectives, and learning indicators. • The teacher conducts an apperception/review by discussing issues related to the current and previous material.
Sparking Historical Empathy	• The teacher displays pictures or videos depicting heroes and the suffering of the people • Students observe the pictures and videos displayed. • The teacher encourages students to ask questions based on their observations of the videos or pictures • Question and answer activities are conducted between the teacher and students to stimulate ideas and thoughts from students • The teacher instructs students to form groups of 4-5 people.
Core Learning Activities	• The teacher distributes worksheets on the Dutch colonial history of Bandung. • Students explore the history of heritage buildings, key figures, and the condition of the people during the colonial period using the internet and compare their findings with digital history textbooks. • Each group also investigates the location using maps and its condition. • The teacher interacts with and guides students by visiting each group.
Communicating data	• The teacher invites each group to present their data analysis and interpretation. • Each group presents their analysis and interpretation, while other students contribute by answering questions raised. • The teacher provides additional explanations as needed.
Conclusion	• The teacher guides students in concluding, reflecting, and generalizing the learning materials, including making predictions for the future. • The teacher outlines the plan for the next meeting. • The teacher closes with prayer and greetings.

Table 5 outlines the preliminary stage of the implementation phase. In this stage, history teachers prepare the necessary classroom learning tools and clearly define the intended learning objectives. It is essential that teachers communicate these objectives so students understand what they are expected to learn and achieve. The lesson begins with apperception, where teachers connect current issues to historical empathy to build relevance. To trigger historical empathy, teachers present a variety of materials, such as images, videos, and digital documents that reflect societal conditions or key figures from the historical period being studied. They incorporate questions within these media to evoke students' emotions, thoughts, and empathy. Following this, students are divided into small groups to collaboratively explore the historical material. The teacher distributes worksheets to guide students through group activities focused on studying historical events, key figures, and the societal conditions of the time. Students are encouraged to use their gadgets to explore historical sources online and access digital history textbooks. Throughout the

activity, the teacher supports students by facilitating their work on the worksheets and addressing any learning difficulties. Each group presents the results of their exploration to the class. To conclude the session, the teacher leads a reflection, prompting students to make connections between the past, present, and future based on what they have learned. Students are also encouraged to reflect on how the values explored in the lesson can be applied in their daily lives. In the evaluation stage, the teacher implements various forms of assessment. During the activity stage, performance assessments and observations are used, though other suitable methods may also be applied depending on the learning context. Empathy-based questions are used at the final stage to evaluate students' understanding.

Development and Revision Stage

The question framework is outlined in Table 6.

Table 6

Results of Validation of Empathy-Based Questions by Experts Validators

Items	Coefficient Validity	Judgments
1	0.8	High
2	0.7	High
3	0.9	Very high
4	0.9	Very high
5	0.8	High
6	0.9	Very high
7	0.9	Very high
8	0.7	High
9	0.9	Very high
10	0.8	High
11	0.8	High
12	0.8	High
13	0.8	High
14	0.9	Very high
15	0.7	High
16	0.8	High
17	0.8	High
18	0.9	Very high
19	0.8	High
20	0.8	High

The graph based on this table illustrates the distribution of instrument validity scores and instrument reliability values.
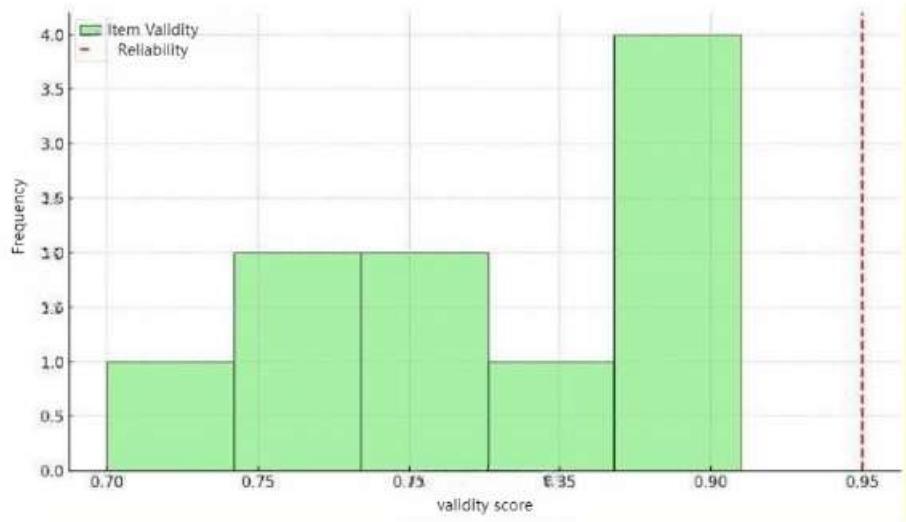
Figure 4. Experts Validity Graph

Validity scores range from 0.70 to 0.91 in Table 6 and Figure 4, with the majority of items above 0.80, indicating that the instrument used has a high level of validity, as values above 0.7 are generally considered good. The instrument's reliability, marked with a dashed red line, is 0.95, which is very high, reflecting excellent consistency in the measurement results. The distribution of multiple-choice questions based on empathy shows that expert validation scores range from 0.7 to 0.9, placing them in the high to very high category. Seven items—No. 3, 4, 6, 7, 9, 14, and 18—received very high validation scores. The remaining 13 items also received very high ratings. These results will be further examined through empirical validation tests to assess the validity and reliability of the historical empathy questions.

Table 7
Expert Validation Results of Model Design Living History Assisted By Digital History Text Book

Aspect	Score	Judgments
Rationale	80	Fit
Purpose	90	Fit
Syntax	80	Fit
Environment	90	Fit

The development of the Living History model, supported by a digital history textbook based on historical empathy, was validated by expert feedback. Each aspect of the model received scores in the range of 80-90: the rational aspect scored 80, the purpose scored 90, the syntax scored 80, and

the environment scored 90. These expert validation results will be further tested empirically in the classroom by students, as presented in Table 8.

Table 8

Empirical Validity in Students

Items	Infit MNSQ	Outfit MNSQ	Judgements
1	1.05	1.06	Fit
2	1.01	1.00	Fit
3	0.99	0.98	Fit
4	0.94	0.99	Fit
5	1.15	1.17	Fit
6	1.05	1.10	Fit
7	1.00	0.99	Fit
8	0.91	0.90	Fit
9	0.98	0.98	Fit
10	1.02	1.01	Fit
11	0.98	0.96	Fit
12	0.95	0.90	Fit
13	0.90	0.85	Fit
14	1.03	1.03	Fit
15	1.06	1.08	Fit
16	1.07	1.11	Fit
17	0.94	0.92	Fit
18	1.03	1.02	Fit
19	0.94	0.98	Fit
20	0.97	0.97	Fit

Based on Table 8, the Infit MNSQ results fall within the range of 0.90-1.15, and the Outfit MNSQ results for the historical empathy questions are within the interval of 0.85-1.17. These results indicate that each historical empathy-based question item aligns well with the PCM 2-PL model. Furthermore, all historical empathy-based questions are deemed fit and empirically valid. The following figure presents the empirical test results for the empathy questions.

```
Item Fit                                                    28/11/24 17:48
all on all (N = 250 L = 20 Probability Level= .50)
---------------------------------------------------------------------------
INFIT
MNSQ          .56     .63     .71     .83    1.00    1.20    1.40    1.60    1.80
---------------------------------------------------------------------------
   1 item 1                                   |    *        .
   2 item 2                            .      |*            .
   3 item 3                            .      *             .
   4 item 4                            .   *  |             .
   5 item 5                            .      |      *      .
   6 item 6                            .      | *           .
   7 item 7                            .      *|            .
   8 item 8                            .   *  |             .
   9 item 9                            .     *|             .
  10 item 10                           .      |*            .
  11 item 11                           .     *|             .
  12 item 12                           .   * |              .
  13 item 13                           .    * |             .
  14 item 14                           .      * .           .
  15 item 15                           .      | *           .
  16 item 16                           .      |  *          .
  17 item 17                           .    * |             .
  18 item 18                           .      |*            .
  19 item 19                           .    * |             .
  20 item 20                           .     *|             .
===========================================================================
```
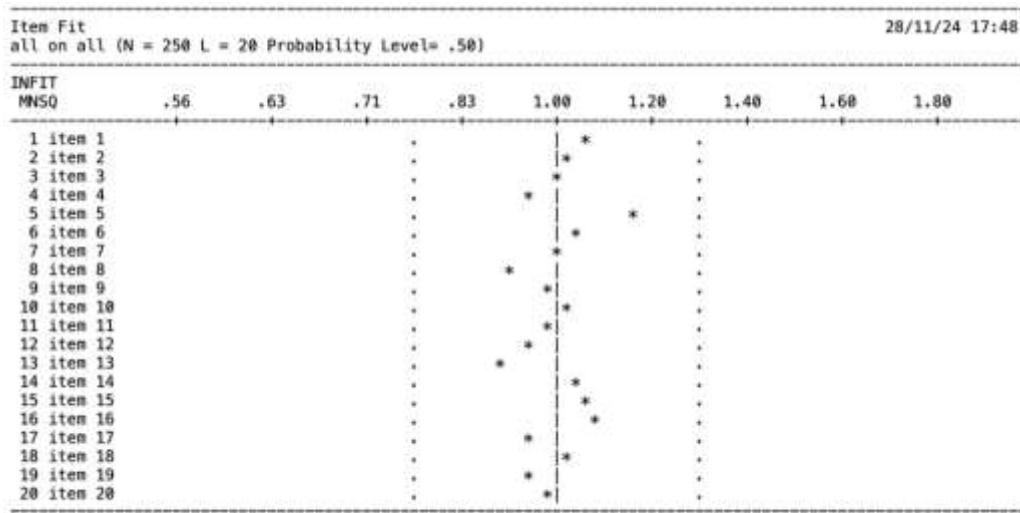
Figure 5. Distribution of Question Items in the Fit Range

Figure 5 illustrates the distribution of fit items within the range of 0.77-1.30. This range shows that the items fall within the MNSQ Infit acceptance area, confirming that the historical empathy questions function normally and are valid. The reliability of the historical empathy question items is also demonstrated through the analysis results obtained using the QUEST program.

Table 9

Reliability

Reliability	Coefficients	Judgements
Summary of item estimate	0.95	Reliable
Summary of case estimate	0.74	Reliable

Based on Table 9, the reliability value for the summary of the item estimate is 0.95, and the summary of the case estimate is 0.74. With a reliability coefficient above 0.60, these values indicate that the historical empathy question items are reliable. The information function graph illustrates the characteristics of the historical empathy question items, showing the relationship between the test information function and the standard error of measurement. The following image presents the results of the Parascale program analysis.
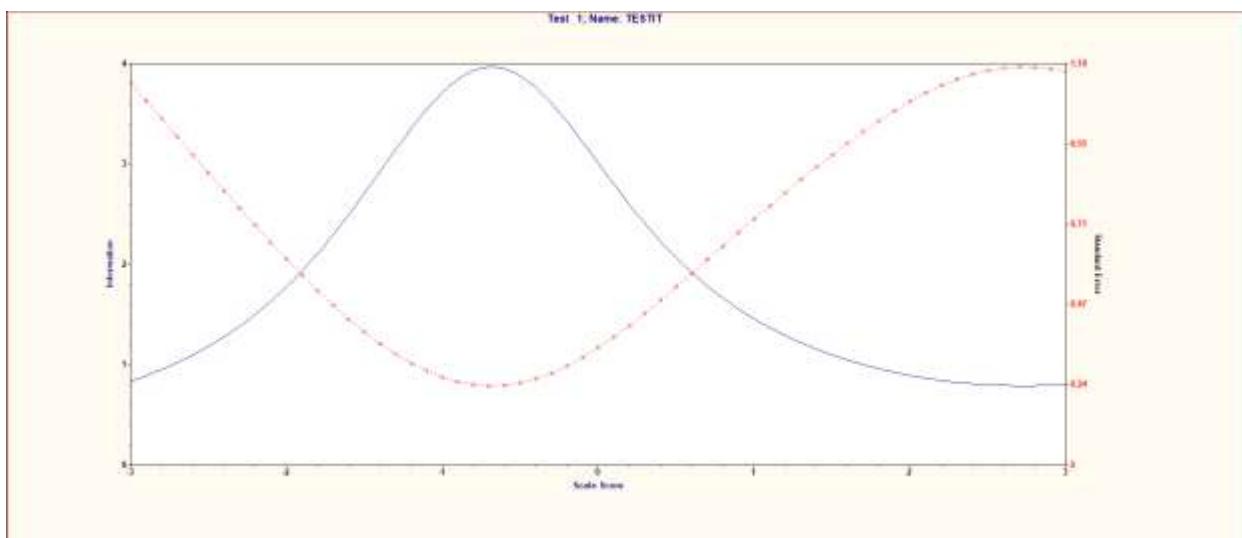
Figure 6. Information Function Graph

As shown in Figure 6, the information function value is 1.9, and the standard error is 0.59. This shows that students with abilities ranging from -2.1 to +0.6 are capable of completing the historical empathy questions. The next stage involves testing the digital history textbook-assisted Living History model in Grade XI schools. The following table presents the validation results.

Table 10
Empirical Validation of the Model

No	Indicator	Validity
1	Developing students' skills	86%
2	Implementation	83%
3	Logical flow	83%
4	Clear learning objectives	83%
5	Interesting model	83%
6	Living history	78%
7	Historical empathy	84%
	Total	83%

The results in Table 10 show that the test was conducted with 24 students at SMAN 1 Tempel. The readability level was 83.5%, indicating that it is suitable for school history learning. Based on this, an experimental trial can now be conducted. The SPSS 17 application was used to analyze the pre-test and post-test scores on critical thinking skills and historical literacy. Below are the analysis results for the average pre-test and post-test scores of each class.

Implementation and Evaluation Stage

Table 11

Average Score Pretest-Posttest

Variable	Test	Class	Respondent	Average
	Pre-test	Experiment 1	35	54.71
Historical empathy	Pretest	Experiment 2	35	54.57
	Pre-test	Control	35	54.00
	Post-test	Experiment 1	35	86.86
Historical empathy	Posttest	Experiment 2	35	84.14
	Posttest	Control	35	82.14

Table 11 shows the average scores for each class. The initial average analytical ability score for each class is 54, showing that the historical empathy levels were the same at the start. However, after receiving treatment, there was a significant increase in historical empathy skills. Experimental class 1 showed the most notable improvement, with an average score of 86. In experimental class 2, the score rose to 84, while the control group remained at 82. The following table image provides a visual representation of these results.
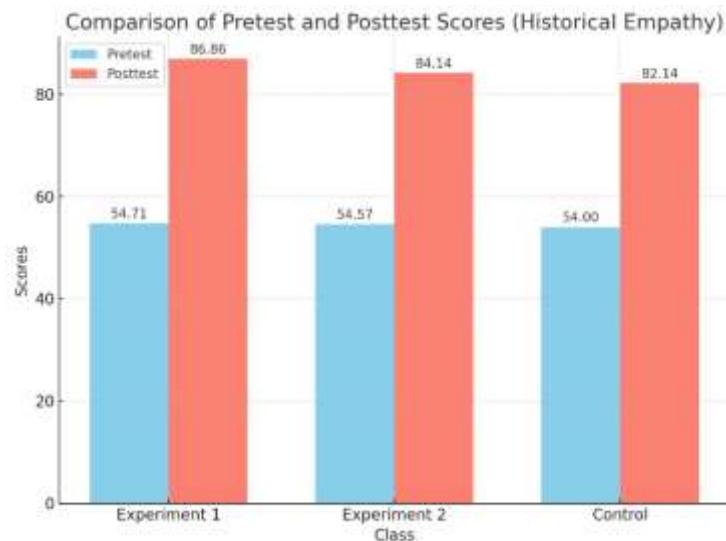

Figure 7. Comparison of Pre-test and Post-test Scores

The pre-test and post-test results provide data for the analytical test. The SPSS 17 program uses General Linear Model (GLM) analysis to process these results. However, before conducting the GLM analysis, the data must pass the preparatory tests for homogeneity and normality. The following Table 12 presents the results of the normality test.

Table 12
Result of the Normality Test

	Class	Statistic	df	p
Pre-test	Experiment 1	.950	35	.116
Historical empathy	Experiment 2	.942	35	.063
	Control	.974	35	.572
Post-test	Experiment 1	.939	35	.053
Historical empathy	Experiment 2	.955	35	.166
	Control	.941	35	.058

Table 12 presents the normality test results for the control and experimental classes 1 and 2. The data normality analysis shows that the historical empathy variable has pre-test and post-test values ranging from 0.063 to 0.572. These results show that the data is normally distributed, as the values fall within the acceptable range of $0.05 < 0.063 – 0.572$. Additionally, Table 13 shows the results of the homogeneity prerequisite test.

Table 13
Result of the Homogeneity Test

		F	df1	df2	p
Historical	Pre-test	1.252	2	102	.290
empathy	Posttest	.816	2	102	.445

The pre-test and post-test values of historical empathy, based on the data homogeneity analysis, yielded a pre-test result of 0.290 and a post-test result of 0.445. These findings indicate that the historical literacy and critical thinking data have a significant value greater than 0.05 $(0.05 <X)$, confirming that the data is homogeneous. Therefore, the GLM test is appropriate. Using SPSS 17 for analysis, the GLM test first investigates hypothesis 1, as shown in Table 13.

Table 14
Test of Within-Subjects Effects

Source		Measure	F	p
Time*Kelas	*Greenhouse-Geisser*	Historical Empathy	3.163	0.00

The results of the first hypothesis test show a significance value of 0.00. Since the result is less than 0.05 $(0.00 < 0.05)$, the hypothesis is accepted. This indicates a variation in historical empathy between experimental classes 1 and 2 and the control group. Next, the second hypothesis is tested to determine whether class attendance has increased or decreased.

Table 15

Test of Pairwise Comparison

Variable	Class	(I) Time	(J) Time	*Mean Difference (I-J)*	p
Historical empathy	Control	*Pre-test*	*Post-test*	-23.167	0.00
	Experiment 1	*Pre-test*	*Post-test*	-36.857	0.00
	Experiment 2	*Pre-test*	*Post-test*	-31.389	0.00

Experiments 1 and 2, which tested the second hypothesis, produced a significance value of 0.00 for the historical empathy variable in the control class. These results show that the alternative hypothesis is accepted, based on the rejection of the null hypothesis and the observed increase in historical empathy in the experimental classes 1 and 2, as well as the control class. The average post-test value is higher than the average pre-test value, as indicated by the negative mean difference value. This suggests that the Living History model with the TPACK approach improves the historical empathy ability of the experimental class. Additionally, the post hoc test, shown in the attached table, examined significant differences between the control, experimental class 1, and experimental class 2.

Table 16

Post Hoc-Multiple Comparison Type Bonferoni

	(I) Time	(J) Time	Mean Difference (I-J)	p
Historical empathy	Experiment 1	Experiment 2	-32.143	.000
		Control	32.143	.000
	Experiment 2	Experiment 1	-29.571	.000
		Control	29.571	.000
	Control	Experiment 1	-28.143	.000
		Experiment 2	28.143	.000

The historical empathy ability variable has a significance value of 0.000 when comparing experimental class 1 to both experimental class 2 and the control class. Since the significance value is less than 0.05, these results indicate a significant difference in the level of historical empathy between experimental class 1 and the control class. Furthermore, Table 16 displays the effect size for each treatment group: the control class, experimental class 1, and experimental class 2.

Table 17
Multivariate Test Type of Hotelling's Tracee

Skills	Class	Partial Eta Squared	Effect Size
Historical Empathy	Experiment 1	0.886	88%
	Experiment 2	0.868	86%
	Control	0.857	85%

Table 17 presents the effect size values for each stimulus across each ability and class. The problem-based learning method impacts 85% of participants in the control class. The Living History model, combined with the TPACK approach, yields an effect size of 88% in experimental class 1, indicating a significant impact on historical empathy skills. Similarly, experimental class 2, which utilizes only the Living History model, demonstrates an effect size of 86% in enhancing students' historical empathy. The following graph illustrates this increase.
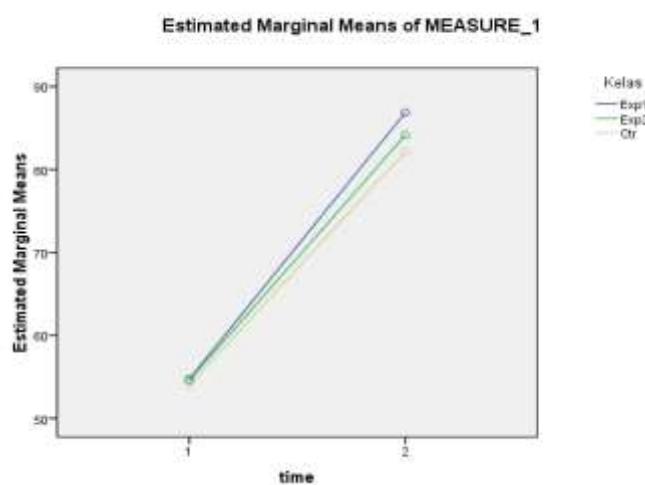
Figure 8. *Historical Empathy Ability Increase Chart*

Figure 8 illustrates the increase in historical empathy across Experiment 1, Experiment 2, and the Control class. In Experiment 1, students initially had a historical empathy score of 54.71. After receiving the Living History model stimulus with the TPACK approach via digital history textbooks, the score significantly increased to 86.86. In Experiment 2, where the Living History model was also used, the historical empathy score increased from an initial 54.57 to 84.14. The Control class, which used the PBL model, also experienced an increase, though not as significant

as the experimental classes. The Control class's score increased from an initial 54.00 to 82.14. The graph clearly shows that the Experiment 1 class experienced the most significant increase, followed by Experiment 2, with the Control class showing the smallest improvement.

Discussion, Conclusion and Implications

The Living History model optimizes the use of historical sources within students' surroundings. History learning often involves utilizing historical sources from around the school, and history teachers frequently incorporate these local sources into their lessons. The Living History model enables teachers to explore and connect with these historical sources when studying specific events. By using local historical sources, the model enhances students' historical empathy, as it allows them to learn about the history of their own area. These historical sources play a key role in preserving historical memory (Awgichew & Ademe, 2022). Collective memory is a present-day factor that sustains values within the local community, and it can serve as a reflective tool for students, fostering historical empathy (Cools, 2024; Olumba, 2024; Sutcliffe, 2024). In this way, collective memory channels historical empathy to students.

The Living History model, using the TPACK approach through digital history textbooks, helps students explore history more effectively. The TPACK approach enables students to access a wide range of historical sources using smartphone technology and the internet, allowing them to explore historical events, the figures involved, various perspectives, and the impact of these events (Kennedy-Eden & Gretzel, 2021; Miralles-Martínez et al., 2019). By exploring these sources, students can deepen their understanding of history. History learning utilizes available local historical sources (Pajriah & Suryana, 2021), and well-maintained historical sources can be invaluable for students' learning. The Living History model leverages these sources to introduce students to historical events, ideas, and figures (Karn, 2022).

The Living History model, which implements TPACK via digital history textbooks, uses a variety of learning media as educational tools. Websites and Google serve as practical resources for exploring historical content from digital history books. Additionally, students can upload primary and secondary sources to Google Sites, enabling easy exploration of historical materials. Technology also helps students avoid issues associated with excessive smartphone use (PSU), such as the spread of hoaxes, anxiety, and social isolation (Elhai et al., 2017). The Living History model with the TPACK approach offers flexibility, allowing students to develop their historical empathy

skills more effectively than with traditional Living History or problem-based learning models. By combining direct visits with technology, this model is particularly suited for today's generation, who are adept at using technology.

These findings are consistent with the work of (Endacott & Brooks., 2018), who emphasize that historical empathy involves both emotional engagement and contextual reasoning. Similarly, (Frentzel-Beyme & Krämer., 2020) found that immersive digital environments can enhance students' emotional connection to historical figures, which supports the effectiveness of the Living History model used in this study. In contrast to previous research that focused solely on fostering empathy through civic education (Raposo et al., 2023; Ross et al., 2023), this research shows that historical empathy can be explicitly developed within the history curriculum when supported by appropriate pedagogical and technological integration.

Furthermore, unlike studies that relied on out-of-classroom experiences, such as museum visits and historical re-enactments, this study confirms that a digitally mediated classroom model can have a comparable affective and cognitive impact. This extends the work of Azmi (2017) and Attisano (2021), suggesting that combining TPACK-informed instruction with digital history resources facilitates empathy-building within regular instructional time, making the model more practical for widespread adoption. Overall, the findings reinforce the importance of integrating content, pedagogy, and technology to address the emotional and intellectual needs of today's learners. This study contributes to the growing body of literature advocating for the explicit integration of historical empathy into classroom-based history instruction through digital innovations.

Building upon these findings, it is also important to reflect on how the TPACK framework contributed to the learning process and the development of historical empathy. The role of the TPACK framework in this study highlights that pedagogical design played a more critical role than technology itself in fostering historical empathy. Teachers apply good pedagogical techniques, which have a positive impact on the practical implementation of TPACK (Koh, 2019). While digital tools enhanced access to historical content and supported immersive learning experiences, it was the structure of inquiry-based learning, guided exploration of historical sources, and structured reflection that most strongly shaped student engagement and learning outcomes. Technology helps students to study history in depth so that it can create value (Zhao, Ren, & Cheah, 2023). This finding underscores the importance of maintaining pedagogical intent as the

primary driver when integrating technology in history education, particularly when aiming to foster affective competencies such as empathy.

This study developed and tested a Living History instructional model supported by digital history textbooks and designed within the TPACK framework. The findings reveal that this model considerably enhances students' historical empathy, both cognitively and affectively. By combining emotionally engaging digital content, inquiry-based tasks, and perspective-taking activities, the model enables students to connect more deeply with the lived experiences of historical figures. Theoretically, the study contributes to the expanding literature on history education by showing how TPACK can enhance not only conceptual learning but also foster affective competencies such as empathy. It further extends the Living History approach from physical settings (e.g., museum visits) to digital classroom environments. Practically, the model offers a feasible and scalable framework for history teachers looking to implement empathy-based learning in technology-rich classrooms. Given the promising results, further research is encouraged to explore the integration of emerging technologies—such as virtual reality (VR), augmented reality (AR), or artificial intelligence (AI)—into history education to enhance emotional immersion and historical imagination. Future studies may also examine the long-term impact of developing historical empathy on students' civic attitudes, tolerance, and critical thinking skills.

Overall, the Living History model presents a meaningful innovation for post-pandemic education, where emotional connection, historical awareness, and digital engagement are not merely optional but essential. The Living History model, using the TPACK approach with digital history textbooks, enhances students' historical empathy, as demonstrated by expert assessments and empirical testing. Furthermore, this model considerably improves students' historical empathy skills, enabling them to empathize with history through the study of historical events, figures, perspectives of historical figures, and the impact of colonization on the Indonesian people. It can be effectively applied at the high school level to maximize the use of historical sites and locations around the school. Additionally, the Living History model contributes to an increase in historical empathy, benefiting students in their broader understanding of history. As a result, future studies could explore the potential of a Living History model based on artificial intelligence. Virtual reality could also be incorporated as the next innovation to further enhance the model.

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