

Empowering Adolescents through Hands-on Wooden boatbuilding Training: Adapting Javanese Wooden Boat Design and Construction for a Teenage-Friendly Training Experience

Daniel M. Rosyid¹ and Samodra^{2,*}

ABSTRACT

In the realm of educational and cultural enrichment, empowering adolescents through hands-on wooden boatbuilding training connects them with Javanese maritime heritage. This scholarly exposition outlines a modern path for youth to engage in traditional wooden shipbuilding, emphasizing tangible skill acquisition and intangible heritage appreciation. The curriculum navigates the confluence of woodworking, mentorship, and cultural identity, fostering youth empowerment. This innovative pedagogical approach views wood sculpting as a vehicle for empowerment, creating a framework for youth-friendly learning inspired by Javanese shipwrights. The proposed model not only crafts seaworthy vessels but also shapes resilient, confident, and empowered young minds, navigating the waves of growth and identity.

KEY WORDS

Empowerment; Adolescents; Training; Adaptation; Boatbuilding.

INTRODUCTION

At the heart of adolescent development lies the need for an education that equips youth with more than just academic knowledge; it calls for the development of holistic skills that prepare young minds for the challenges and opportunities that await them in the future. Integral to this comprehensive educational experience is the incorporation of innovative, engaging, and practical teaching methodologies that groom adolescents into competent, creative, and culturally aware adults.

A paradigm that fulfills these criteria is the art of traditional Javanese wooden boatbuilding, an Indonesian cultural hallmark that is as much about craftsmanship as it is about heritage and communal identity (Clark et al., 1993).

Tucked away within the vast maritime expanse of the Indonesian archipelago, the island of Java quietly harbors a tradition that encapsulates both the essence of cultural ingenuity and the spirit of nautical exploration that has come to define the region for centuries. Javanese wooden boatbuilding is not merely a craft; it is a limbic narrative, interwoven with the lives of the people who build these vessels and the seas they navigate. It speaks of a symbiosis between nature and human endeavor, between the trees that furnish the material and the hands that mold it into form. This intrinsic relationship, filled with lessons of sustainability, resilience, and engineering, holds untapped educational potential, particularly for the youthful learner (Barker, 1993).

¹ Department of Ocean Engineering, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

² Department of Naval Architecture and Shipbuilding, Muhammadiyah University, Gresik, Indonesia

* Corresponding Author: nfsamodra@gmail.com

The present paper endeavors to explore the transformative prospect of adapting the Javanese boatbuilding tradition for adolescent training programs with a particular emphasis on empowerment as a fundamental outcome. The need for such an interventional approach in educational systems cannot be overstated, especially in an era that is rapidly shifting towards abstract, disconnected modes of learning. By bringing this centuries-old maritime artisanry into training modules, the contemporary youth can be imbued with a rich concoction of hard skills such as woodworking, design, and physics, coupled with soft skills like teamwork, problem-solving, and cultural intelligence (Belasus & Daly, 2023; Ellis, 2009).

This fusion of practical know-how and socio-emotional development embedded within a cultural context promises to deliver a multi-faceted learning experience. Adolescents engaged in this hands-on woodworking journey will not only inherit the rich legacy of their forebearers but also arm themselves with a suite of applicable skills and competencies. Moreover, by crafting something tangible and enduring, such as a wooden boat, they participate in a rite of passage that instills a robust sense of self-efficacy, accomplishment, and pride (Bogucki, 2008).

However, the question remains: how does one translate an involved and intricate tradition such as Javanese wooden boatbuilding into an accessible, engaging, and rewarding experience tailored for the young modern learner? It is a task that involves a careful balance of respect for tradition with the pragmatism of educational application (Mitsuyuki et al., 2020).

Modifications and adaptations are necessary to cater to the learning requirements and safety of adolescents, all while ensuring the essence of the craft is not lost but rather emphasized and cherished (Roberts et al., 1994).

Moreover, the process must be cognizant of the current societal trends and the adoption of technological advancements. Youths today are digital natives, and the use of technology must be adeptly integrated into the learning process to heighten their engagement and to bridge the gap between traditional craftsmanship and contemporary learning environments (H. De Rosa et al., 2012).

Such an endeavor also brings forth considerations of pedagogical theory, instructional design, and curriculum development. It is about curating an experience that respects the cognitive and psychological developmental stages of adolescents (Hunt, 2012). It is about embracing a multidimensional teaching approach that fosters not just skills but also an awareness of environmental stewardship, an appreciation for cultural diversity, and a sense of connectedness with the global historical narrative (Allen, 2022).

Through a pedagogical lens, the paper examines the theoretical frameworks and educational underpinnings that support such an integration of tradition into teaching. It delves into constructivist theories, experiential learning models, and the latest in educational psychology to discern methodologies that both resonate with the targeted age group and deliver on instructional goals. The manuscript also explores the socio-cultural importance of maintaining such crafts, the potential impact on local communities, and how engaging the youth in this tradition can foster a new generation of custodians for intangible cultural heritage (Zhao et al., 2023).

In dissecting the role that this adaptation of Javanese boatbuilding can play in the broader scope of adolescent empowerment, the discussion extends to include the expected outcomes and deliverables of such a program. These include the development of technical acumen, enhancement of socio-emotional intelligence, promotion of cultural pride, and ultimately, the cultivation of a self-empowered individual ready to navigate the complex seas of the contemporary world (Allen, 2022; H. M. De Rosa et al., 2015).

As such, the paper sets the stage for a comprehensive exploration of how the ancient lore of Javanese wooden boatbuilding can be reframed and restructured as a potent instrument for modern education, a tool that does not merely impart knowledge but actively empowers the learner. It provides the foundation upon which a rich tapestry of cultural education can be woven, never losing sight of the ultimate goal: to mold adolescents who are not just learned but empowered, not just skilled but also enlightened; individuals who are the very embodiment of the fusion of tradition with modernity, of the past with the future.

THE RELEVANCE OF BOATBUILDING TRAINING IN ADOLESCENTS FORMATTING

In the multidimensional world of education, specific approaches and disciplines serve as pivotal gateways to a spectrum of learning outcomes and skill development. Notably, among such methods, boatbuilding training has emerged as a remarkable platform that dissipates its echoes across diverse dimensions such as the mechanical, structural, aesthetics, and historical.

This craft, particularly as it unfolds in the context of traditional Javanese boat design and construction, possesses inherent potential to not only stimulate intellectual growth but also cultivate personal attributes and codify cultural connections for adolescents, a transformative experience that amalgamates the richness of heritage, the wisdom of age-old techniques, and the value inculcation of priceless transferable skills (Hunt, 2012).

When analyzed closely, the intricate process of boatbuilding offers numerous touchpoints of mechanical understanding for the learner. It introduces students to the basic principles of woodworking, from selecting and preparing the right materials to understanding the various types of tools, their uses, and safe handling methods.

Beyond learning the pragmatic value of creating something tangible and useful, young learners gain exposure to concepts such as buoyancy, load bearing, balance, and propulsion, which inadvertently steep them in the fundamentals of physics and engineering (Stammers, 2001).

The hands-on application of these principles not only serves as a practical demonstration of theoretical knowledge but also promotes an in-depth comprehension of how different mechanical aspects merge to give life to a complete sea-going vessel.

On a more sophisticated level, the design and construction of a boat demand an understanding of structural concepts. Students learn about the importance of creating a durable, robust framework that can withstand the elements, the steps to ensure symmetry and balance, and the elements that contribute to a boat's overall stability and functionality.

This exposure cultivates an appreciation for how integral the combination of various constituents, wood pieces, hull design, deck arrangement, is to the working of the complete, structural entity. Understanding these concepts prepares adolescents for potential interests and careers in architecture, structural engineering, and product design (Kahanov et al., 2012).

Inescapably, boatbuilding is not a process devoid of artistry. The craftsmanship requires an eye for detail and an aesthetic sense that ensures the finished product is pleasing to the eye. Javanese boat design is well-regarded for its distinct, intricate detailing that can be seen as an expression of cultural art inherited through generations.

The opportunity to learn, appreciate, and contribute to this retained aesthetic appreciation in adolescents can help foster a belief in the value of traditional art and the potential for its modern reinterpretation (Martín Seijo et al., 2021).

Equally significant is the historical facet woven into the very fabric of Javanese boatbuilding. As the adolescents attune to innovative building techniques, they inadvertently uncover layers of historical information lurking beneath. They explore a rich tapestry of maritime history, socio-cultural norms, and philosophical underpinnings that have shaped the very tradition they are engaging with. This understanding bridges generations and fosters respect for the wisdom and skills of ancestors, thereby building a profound connection with their cultural lineage (Domínguez-Delmás et al., 2023).

Delving deeper beyond academic growth, engaging adolescents in the process of boatbuilding offers a fertile landscape for the germination of essential character traits. The art of crafting a boat is a testament to patience since the process requires careful precision and does not permit haste. Dedication and persistence are instilled as the project demands time, effort, and a consistent commitment to see the craft move from an idea to reality (Grieco et al., 2020).

Moreover, since boatbuilding is rarely a solitary endeavor, students learn the essence of teamwork and cooperation. They experience the division of labor, the necessity of communication, and the shared responsibility that fosters a communal spirit. It births an understanding of collective responsibility and helps students grow into more collaborative, thoughtful individuals, attributes that are invaluable for personal growth and career success (Teo et al., 2021).

Simultaneously, the boatbuilding journey amplifies the spirit of determination and resilience. The path to completion might be strewn with failed attempts, challenging stages, and moments of self-doubt. However, overcoming these obstacles instills a sense of accomplishment, self-efficacy and nurtures the courage to persist amid adversity, an experience resembling the arduous but rewarding voyage of a boat on the sea (Imron & Abdullah, 2023).

By engaging youth in the Javanese tradition of boatbuilding, the educational prospect goes a step further, infusing cultural appreciation alongside practical wisdom. These adolescents gain first-hand insight into the philosophy and principles echoed in every curve, joint, and finishing touch of the boats they build. They unwittingly become custodians of a rich cultural legacy, appreciating, preserving, and potentially passing on their knowledge to future generations (Barker, 1993).

The acquisition of practical, transferable skills through boatbuilding initiatives imparts a unique edge to adolescents, preparing them for versatility in various fields in the future. They become equipped not only with technical knowledge but also insights into project management, problem-solving, and critical thinking, proficiencies that persist beyond the boatbuilding classroom and into their adult life (Allen, 2022; Szubska et al., 2023).

In its essence, the pedagogy of traditional boatbuilding embodies a worldview on education: a journey of self-exploration, discovery of heritage, initiation into adulthood, and protocols of community living. Simultaneously, it is an experiential journey that opens young minds to the infinity of their potential (Rodzala & Saat, 2018). A pathway to empowerment, the relevance of teaching Javanese boatbuilding to adolescents can be seen as a catalyst in their evolution: an evolution from learners to creators, from students to skilled practitioners, and ultimately, from adolescents to empowered adults ready to navigate the vast ocean of life's opportunities.

ADAPTING THE JAVANESE WOODEN BOAT DESIGN FOR ADOLESCENT TRAINING

The encapsulation of traditional Javanese wooden boat designs within an adolescent training program brings about an intriguing challenge. It necessitates adapting an age-old craft, complex, nuanced, and rooted in layers of cultural knowledge and skill, into an accessible, appealing, yet formative educational experience for youth. The process of adaptation needs to strike a thoughtful balance between preserving the essence of the craft and making the experience stimulating, relevant, and youth-friendly. This section explores addressing this challenge by simplifying complex techniques, incorporating technological integration, and enhancing engagement strategies for a holistic learning environment fostering adolescent development (Liu et al., 2019).

The Boat Design

Javanese traditional wooden boats, known for their cultural significance and historical roots, provide a unique foundation for innovative adaptations in modern boat design. The general arrangement of Javanese traditional wooden boats can be creatively integrated with contemporary elements, fostering a harmonious blend of heritage and functionality. Adapting their design for contemporary use involves respecting and drawing inspiration from the cultural heritage embedded in these vessels. The general arrangement reflects a balance between preserving the authenticity of the original design and incorporating practical modern features.

Ergonomics in the general arrangement should be approached with a focus on preserving the traditional aspects of Javanese boat design. The arrangement should be strategically positioned to reflect the cultural context, ensuring a comfortable and authentic experience. This integration of ergonomic principles with traditional aesthetics contributes to a seamless fusion of old and new.

Building the wooden boat for this training purpose should also involve a commitment to sustainable construction methods. Emphasizing the use of locally sourced, renewable materials and traditional building techniques contributes not only to the authenticity of the design but also to the environmental sustainability of the vessel. This approach aligns with the ethos of Javanese craftsmanship, which historically prioritizes harmony with nature. The construction of this training wooden intentionally avoids the use of wood from natural forests and exclusively utilizes wood sourced from cultivation which are Teak wood (*Tectona grandis*) and Mahogany (*Swietenia mahogani*) harvested from managed cultivated forest.

Adapting the general arrangement of Javanese traditional wooden boats for contemporary use involves a delicate dance between heritage and innovation. Preserving cultural authenticity, optimizing spatial arrangements, infusing ergonomics with tradition, embracing sustainable construction methods, and integrating technology with sensitivity are crucial aspects of this transformative process. In doing so, designers can create vessels that not only pay homage to Javanese maritime traditions but also serve as a bridge between the past and the future of wooden boat design.

The frames are made using wood lamination techniques in which wooden materials are placed together to form a strong and water-resistant structure. Lamination techniques are employed to reduce the use of natural bent timber for the frames constructions and to improve structural performance. By utilizing lamination techniques, boats can be designed with better durability without sacrificing the sustainability of resources. This technique enables manufacturers to achieve an optimal combination of strength, lightweight construction, and resistance to environmental conditions in water.

The boat name is Putri Mayangmadu, translated into English as 'The Daughter of Mayangmadu.' The name originates from a local folklore featuring Prince Mayangmadu, whose name literal translation means Sugar Palm (*Arenga pinnata*). Prince Mayangmadu served as a prominent local chief during the Javanese classical era, possibly acting as the Harbor Master of the Paciran coastal area, where the boatyard for the training project is located.

Principal Dimension of the Boat:

| | |
|--------|---------------|
| LOA | : 12.85 meter |
| LBP | : 11.10 meter |
| B | : 4.00 meter |
| H | : 1.65 meter |
| T(max) | : 1.10 meter |

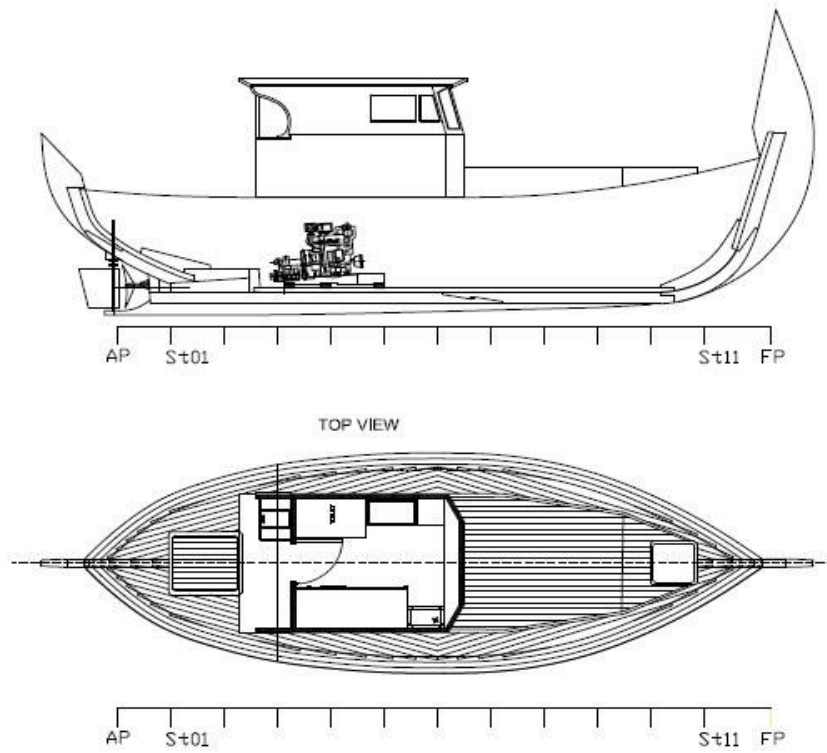


Figure 1: General Arrangement

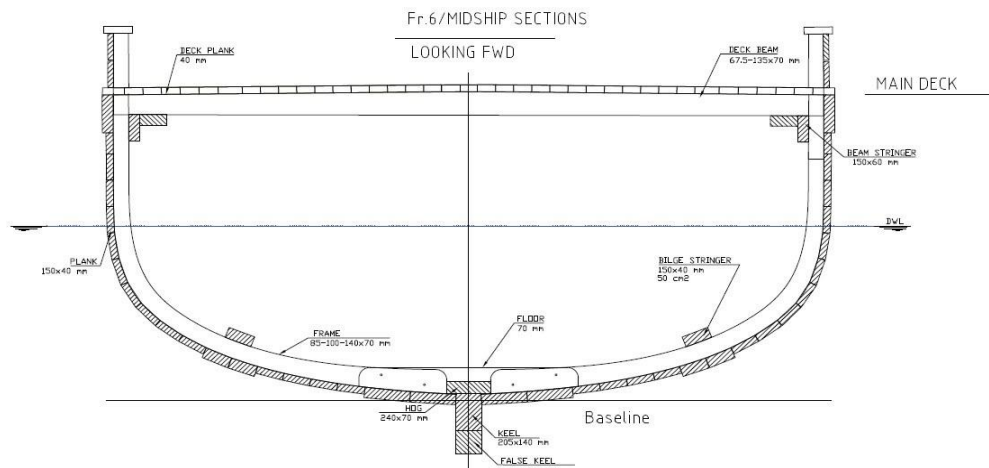


Figure 2: Midship Section



Figure 3: The Daughter of Mayangmadu is seen side by side with a traditionally built Javanese wooden fishing boat

The Builders Team

The boat was constructed in a traditional wooden boatyard in Kandangsemangkon Village, Paciran East, Java (Coordinates 6052'17.02"S - 112018'50.02"E) as a training project for a team of students from SMK Negeri 3 Buduran Sidoarjo – a state-owned Vocational High School – and students from SMK Sunan Drajat, Paciran – a local Islamic Vocational Boarding High School. The teamwork involved 45 male and female students, guided by 4 Master Boatbuilders as trainers. The training lasted for 8 months, with 6 months dedicated to fieldwork. Throughout the training period, the students stayed in provided housing next to the boatyard.



Figure 4: The students are constructing the boat's laminated frames in the school workshop



Figure 5: The students are working on setting the frames in the boatyard.



Figure 6: Completing the hull construction



Figure 7: Pre-launching



Figure 8: Sea Trial

Simplification of Technical Aspects

An accurate replication of traditional Javanese boatbuilding techniques may involve intricate processes, high-end tools, and a level of skill mastery typically earned over years, if not decades, of practice. For an adolescent demographic, some of these aspects could appear daunting, unnecessarily arduous, or even unsafe, potentially hampering youth's buy-in into the learning process. Therefore, it becomes crucial to devise a simplified model of boatbuilding that retains the core elements of the tradition yet is streamlined, achievable, and safe for younger learners (Belasus & Daly, 2023).

The first step would be to distill the techniques into their most basic elements, ensuring that the fundamental concept, approach, or principle that drives the technique remains intact. This simplified design needs to be easily comprehensible to the adolescent mind, scaffolding upon students' existing abilities and understanding. By strategically reducing the complexity, it ensures the learners are not overwhelmed, thus promoting a sustainable and fulfilling learning journey that gradually grows in depth and sophistication (Indruszewski, 2008).

One example of simplifying boat construction involves utilizing lamination techniques for futtock constructions and designing jigs to facilitate students in forming the futtock and assembling other frame parts without excessive complexity.

While preserving cultural authenticity, the use of age-appropriate, modern tools becomes instrumental in maintaining safety, efficiency and reduced physical effort. Protective gear, accompanied by strict safety protocols, can ensure that the students can engage in the process without posing unnecessary risks. Moreover, the incorporation of simpler, ergonomically designed tools mitigates the risk of injury and drastically increases the students' sense of mastery and confidence in handling the tools, empowering them to explore deeper into the craft (Kahanov et al., 2012; Khalilieh, 2005).

Use of Technology

In an era where adolescents are essentially digital natives, a crucial aspect of the adaptation process lies in integrating technology within the traditional boatbuilding training. This adoption not only makes the training more relatable to modern youth but also expands the horizons of their understanding, application, and interest in the craft (Ma et al., 2023).

One compelling tool for this purpose could be Learning Management System. This tool will enable online distance learning, anywhere anytime as long as the internet connection is available.

The learning management system employed is Moodle, an open-source platform software, complemented by instructional videos developed specifically for boat construction tasks. These videos guide students through various stages of the construction process, offering detailed demonstrations and explanations. By integrating video instruction into Moodle, students benefit from visual aids that enhance their understanding and retention of complex concepts and techniques involved in boat building. This multimedia approach not only facilitates learning but also allows students to review and reinforce their skills at their own pace, ensuring comprehensive mastery of the construction process.

In the intricate planning and design stages of boatbuilding, Learning Management System can provide an immersive way for students to understand and visualize the project before they even lift a single tool. They can study the technical and the 3D drawings of the proposed boat, inspect it from every angle, and comprehend the structural nuances, a previsualization process that could significantly intensify their conceptual understanding. The 3D Drawing could also provide a safe, virtual sandbox where students can practice certain construction methods or procedures before replicating them in the real world. This risk-free, immersive experience allows for learning through practice minus the risk, fostering a heightened sense of preparation and confidence when transitioning to real-world application.

Moreover, using modern software to design, simulate, and test the boats on a computer allows adolescents to align their insights about traditional craftsmanship with contemporary design principles. This computer-aided design (CAD) integration opens an engaging dialogue between tradition and technology, an exciting arena of exploration that could be massively appealing to technological affinities of modern youth. Introducing technology in the teaching of traditional boatbuilding is, therefore, about creating relevant bridges between the traditional and modern worlds of learning. It's about using tools that adolescents are familiar with, to teach them skills that have their roots in the distant past but are still as relevant today.

Enhanced Engagement

The art of teaching, more so when it involves encapsulating culturally rich traditional skills within an adolescent learning net, lies in thoughtfully enhancing student engagement. The efficacy of the boatbuilding training program will pivot upon the ability to capture students' curiosity, sustain their interest, and motivate them towards continual growth in mastering the craft.

Consequently, designing the program thoughtfully with ample opportunities for hands-on activities, group collaboration and gamification could be the catalysts in transforming the experience into an engaging, empowering journey rather than a mere technical skill-learning endeavor (Grieco et al., 2020).

Firstly, hands-on activities present an experiential learning environment where students can tangibly interact with the processes and see the fruits of their efforts materialize in real-time. The amalgamation of 'thinking' and 'doing' fosters deeper comprehension, retention, and satisfaction stemming from active learning. It positions the students as active creators rather than passive receivers, thereby continually cultivating their intrinsic motivation (Eggenberger & Backes-Gellner, 2023).

Secondly, the incorporation of group tasks within the boatbuilding process fosters students' interpersonal and collaborative skills. Building a boat in teams not only lightens the workload but also births an atmosphere of mutual reliance, shared accomplishment, and communal kinship, values that resonate with the societal orchestration of traditional Javanese boatbuilders (Erstad & Siddiq, 2023).

Lastly, incorporating gamification elements in the boatbuilding process can convert learning tasks into challenges, making the process more enjoyable and motivating for adolescents. Leaderboards, progress bars, badges, or other rewarding elements can boost student motivation. Also, integrating positive reinforcements such as certifications, rewards, or school credits can serve as powerful incentives to spur interest and induce motivation, ensuring progress is recognized and valued, fostering a sense of accomplishment and ownership among the learners (Hassan et al., 2017; Omar et al., 2020).

Gamification can take the form of students circling the boat and playing while inspecting various parts of a ship's construction that are perceived to be incorrect. They are discussing and arguing about the result of the inspections with an instructor supervising and acting as the judge. Rewards can be given to those who identify the most errors. Rewards can also be given to students who provide arguments explaining why a particular error occurred.

In adapting the Javanese wooden boat design for adolescent training, an essential consideration remains harnessing the profoundness of formative skills nestled in cultural wisdom. It's about simplifying while preserving, modernizing without losing authenticity, and engaging without overwhelming. Continual careful calibration of these components can ensure that the resulting training program rhetorically communicates its relevance to adolescents, both as a tribute to their shared cultural heritage and as a skillset geared towards their future prospects (Ciarli et al., 2021).

OUTCOMES AND EMPOWERMENT

The fruition of a well-adapted Javanese wooden boat design training program for adolescents must be seen not just in completed boats or acquired skills, but in the broad-sweeping developmental accomplishments, and ultimately, empowerment, of its participants. This experience is expected to yield multifaceted outcomes, propelling students into a realm where they are not only cognizant of the value of traditional craftsmanship but also possess enhanced capabilities that span the technical, social, and cognitive domains (Belasus & Daly, 2023; Roberts et al., 1994). They are likely to emerge with a fortified sense of accomplishment, cultivated teamwork dynamics, a deepened cultural understanding, and a profoundly entrenched sense of personal empowerment. This section delves into the expected outcomes from such a transformative educational journey.

Appreciation of Traditional Craftsmanship

Upon successfully completing training that interlaces the historic threads of Javanese boatbuilding with innovative teaching methods aimed at modern adolescents, students are likely to develop a robust appreciation for traditional craftsmanship. This appreciation stems from understanding the effort, skill, and artistry involved in creating something magnificent from raw materials, all while honoring the time-tested practices of their ancestors. However, their admiration would extend beyond mere recognition; they will internalize the craftsmanship as part of their cultural identity and legacy, a precious heritage to be preserved and cherished (Indruszewski, 2008).

Enhancement of Technical Skills

Naturally, through the detailed and immersive process of boatbuilding, technical skills are honed to a significant degree. Students learn to work with various tools, materials, and methodologies that are both traditional (in respect to Javanese designs) and modern (in relation to contemporary tools and safety practices). The practical knowledge encompassing woodworking, material selection, design principles, and structural integrity interwoven with the efficiency of modern technology provides these adolescents with a unique edge. They add to their toolbox of competencies an array of valuable skills that serve them in various fields, from engineering to design to environmental science (Kahanov et al., 2012).

Social Skills Acquisition

A crucial part of the learning process during the boatbuilding training is the enhancement of social skills. Given that boatbuilding is often a communal effort, students learn valuable lessons in teamwork, communication, leadership, and cooperation. The necessity to collaborate with peers, respect different roles, and contribute effectively to a shared goal is a powerful life lesson that transcends the context and becomes a guiding principle for community life and work environments they will enter later on (Imron & Abdullah, 2023; Jaaffar et al., 2016).

Cultivation of Problem-Solving Abilities

Problem-solving is an inherent part of any constructive or creative task, and boatbuilding is no exception. Adolescents engaged in building a boat face various challenges that demand innovative solutions, whether it's adapting a design to better suit materials at hand or rectifying a structural issue uncovered during a trial. Learning to troubleshoot in the workshop, students apply logical reasoning, critical thinking, and creativity, which becomes a habit of mind beneficial in all aspects of life (Hudnall & Kopecky, 2020).

A Sense of Accomplishment

There is a monumental sense of accomplishment that comes from completing a boat. It's a tangible testament to the students' efforts and skills, a visible, floatable product of their dedication. This sense of accomplishment is profound and resonates deeply, often contributing to heightened self-esteem, a reinforced belief in one's abilities, and a validation of personal effort. The process from start to finish is a journey through which students confirm to themselves that they are creators, builders, and finishers (Messinis & Ahmed, 2013).

Teamwork Dynamics

The collaborative nature of the boatbuilding process fosters not just an ability to work in a team but an intrinsic understanding of group dynamics. Students experience first-hand how a team functions efficiently with the distribution of tasks, reliance on fellow team members, and productive synergy required to achieve a common goal. These teamwork dynamics are invaluable not just in their immediate educational environment but as preparation for their professional life and as active citizens (Eggenberger & Backes-Gellner, 2023; Erstad & Siddiq, 2023).

Deepened Cultural Understanding

By its very nature, the program is steeped in cultural education. By learning the traditional methods of Javanese boat construction, students gain more than just a superficial textbook understanding of their heritage. They gain hands-on, pragmatic comprehension of their cultural history, imbuing within them a respect for their cultural identity and a passion for its conservation and celebration (Hensel et al., 2021).

Personal Empowerment

Finally, and perhaps most importantly, the experience of learning to build Javanese wooden boats culminates in a heightened sense of personal empowerment. Adolescents learn that they can wield tools, create complex designs, work collaboratively, overcome challenges, and complete significant projects. This empowerment transcends the immediate skills learned, it's the realization that these young individuals can engage with their tradition in meaningful ways and are equipped to contribute their inherited knowledge and novel insights to their communities and the wider world (Hassan et al., 2017).

In essence, the outcomes of Javanese wooden boat design training for adolescents are both immediate and enduring. Participants benefit from a unique confluence of skill acquisition and personal development. They are apprentices not only in the artistry of boatbuilding but also in the more subtle art of weaving their newfound skills, cultural understanding, and collaborative experiences into the broader tapestry of their lives (Omar et al., 2020). These outcomes do not just empower students as individual artisans or technicians; they empower them as custodians of a rich cultural heritage, responsible community members, and proactive contributors to society.

CONCLUSIONS

Integrating traditional Javanese wooden boat design into an adolescent training program represents a compelling, holistically beneficial endeavor. It's an innovative crossroads where tradition meets modernity, enriched cultural heritage greets empowering skill learning, and youthful vigor finds a constructive, purposeful outlet. With strategic adaptation that appropriately aligns with adolescents' cognitive capacities and interests, this fusion of boatbuilding craft with modern

pedagogical techniques emerges as a promising avenue for engaging, empowering, and educating the next generation. By creating a learning space that respects and highlights the intricacies of Javanese boatbuilding craftsmanship while ensuring the experience remains appealing and relatable to modern youth, the training brings about a vibrant educational panorama. It encompasses skill-building, character shaping, and cultural education in an integrated, immersive, and hands-on manner. The process is just as striking as the product, a unique educational journey where adolescents explore, indulge their curiosity, challenge their creativity, and apply their problem-solving acuity.

This harmonious amalgamation of traditional knowledge and contemporary teaching approaches equips youth with an array of tangible and intangible skills. It fosters in them a sense of pride in their cultural identity, a conviction in their capacity to work constructively and collaboratively, and a confidence in their hands-on abilities. The training embodies a symbiotic blend of imparting proven craftsmanship, transmitting cultural essence, and cultivating personal capabilities.

At its core, the adapted training program aims to retain the essence of traditional Javanese boat design while making it a lively, appealing, and empowering learning environment for youth. With both physical and digital tools, fostered team dynamics, and an engaging curriculum that seamlessly interweaves learning with application, the program sets sail to craft an experience as unique as the boats themselves.

It unfolds as a pathway that not only introduces the intricacies of Javanese tradition to a younger demographic but also tangibly empowers them with a tactile, innovative craft. But importantly, the empowerment transcends the confines of the workshop, it is the empowerment of self-confidence, creative expression, cognitive flexibility, and cultural appreciation. So, with every wooden plank carved and every boat finished, students don't just learn to build boats, they learn to navigate new avenues of personal growth, societal contribution, and cultural preservation.

In conclusion, the promising prospect of adapting Javanese wooden boat design for an adolescent training program speaks of an engaged, meaningful, and empowering educational experience. It represents a steppingstone towards connecting young minds with their cultural roots on a personal, relatable, and impactful level. By bridging the gap between the old and the new, the practical and the conceptual, the individual and the collective, the training project creates an educational space that resonates with the dynamism, curiosity, and potential of adolescence. This adaptation, therefore, guides the younger generation to create a future that respects the past and readily shapes the present in the pursuit of "mastery for the seas."

CONTRIBUTION STATEMENT

Author 1: Conceptualization; methodology; writing **Author 2:** conceptualization; writing and editing, figures and pictures.

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