

Examining Innovation in Industrial Arts: Going Beyond Wood and Metal

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Industrial Arts has long been associated with traditional craftsmanship wood carving, metalwork, and mechanical drawing. In Philippine classrooms, the subject has served as a foundation for hands-on learning, teaching students practical skills tied to labor, production, and repair. However, as the world shifts toward a knowledge-based and innovation-driven economy, the role of Industrial Arts in education must also evolve. Today's challenges, such as environmental degradation, automation, and rapid technological change, demand a broader, future-forward approach. Integrating digital tools, sustainability, and design thinking, Industrial Arts in the Philippines can transcend its conventional mold and empower students with 21st-century competencies (Herfurth et al., 2025).

In many public and private schools across the country, Industrial Arts is still taught using outdated equipment and limited resources. Lessons are often restricted to woodworking and metalworking, sometimes neglecting how the world of design and production has changed. While these traditional skills remain valuable, they are no longer sufficient. The emergence of 3D modeling, computer-aided design (CAD), and even basic coding are now integral to industrial processes globally (Nyemba, 2022). These digital tools allow for precision, innovation, and efficiency skills that are increasingly essential in both technical and creative industries. Equipping students with access to basic digital design software, 3D printing concepts, and digital fabrication workshops can open the door to modern applications of Industrial Arts (Puddicombe et al., 2025).

Sustainability is another urgent consideration. The Philippines, being highly vulnerable to the effects of climate change, cannot afford to teach production and design without addressing the environmental consequences of resource use. Conventional projects like furniture-making or metal crafts can incorporate sustainable practices such as using reclaimed wood, upcycled metal, or biodegradable finishes. Furthermore, students should be encouraged to evaluate the environmental impact of materials and processes through life-cycle assessments and eco-friendly innovations (Müller et al., 2024).

According to Pyatkin (2025), Design thinking invites iteration, testing, and collaboration skills that are not only practical but vital in modern industries and entrepreneurship. Design thinking, as a creative and solution-oriented mindset, can also elevate the impact of Industrial Arts. Instead of merely following templates or manual instructions, students can be encouraged to empathize with real-world problems and generate human-centered solutions. For instance, rather than

constructing generic wooden stools, learners can work on designing lightweight, durable furniture suitable for typhoon-prone areas or modular learning tools for students in geographically isolated schools.

In Philippine technical-vocational institutions and Senior High School tracks under the Technology and Livelihood Education (TLE) strand, some schools have begun adopting these innovations. Initiatives such as the Department of Science and Technology's (DOST) Fab Labs offer digital fabrication and prototyping spaces that allow students to build and innovate using modern equipment. These early models show that transformation is possible, even within limited budgets, as long as there is community support, public-private partnerships, and an openness to reimagining what Industrial Arts can be.

The future of Industrial Arts in the Philippines lies not in abandoning traditional methods, but in enriching them. Embracing digital tools, prioritizing sustainability, and adopting design thinking. According to Castro et al. (2024), educators can provide students with the skills, mindset, and relevance needed for the modern world. It is no longer just about building tables or welding metals it is about crafting solutions, nurturing innovation, and preparing the next generation of Filipino makers to build a better, more sustainable future.

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