

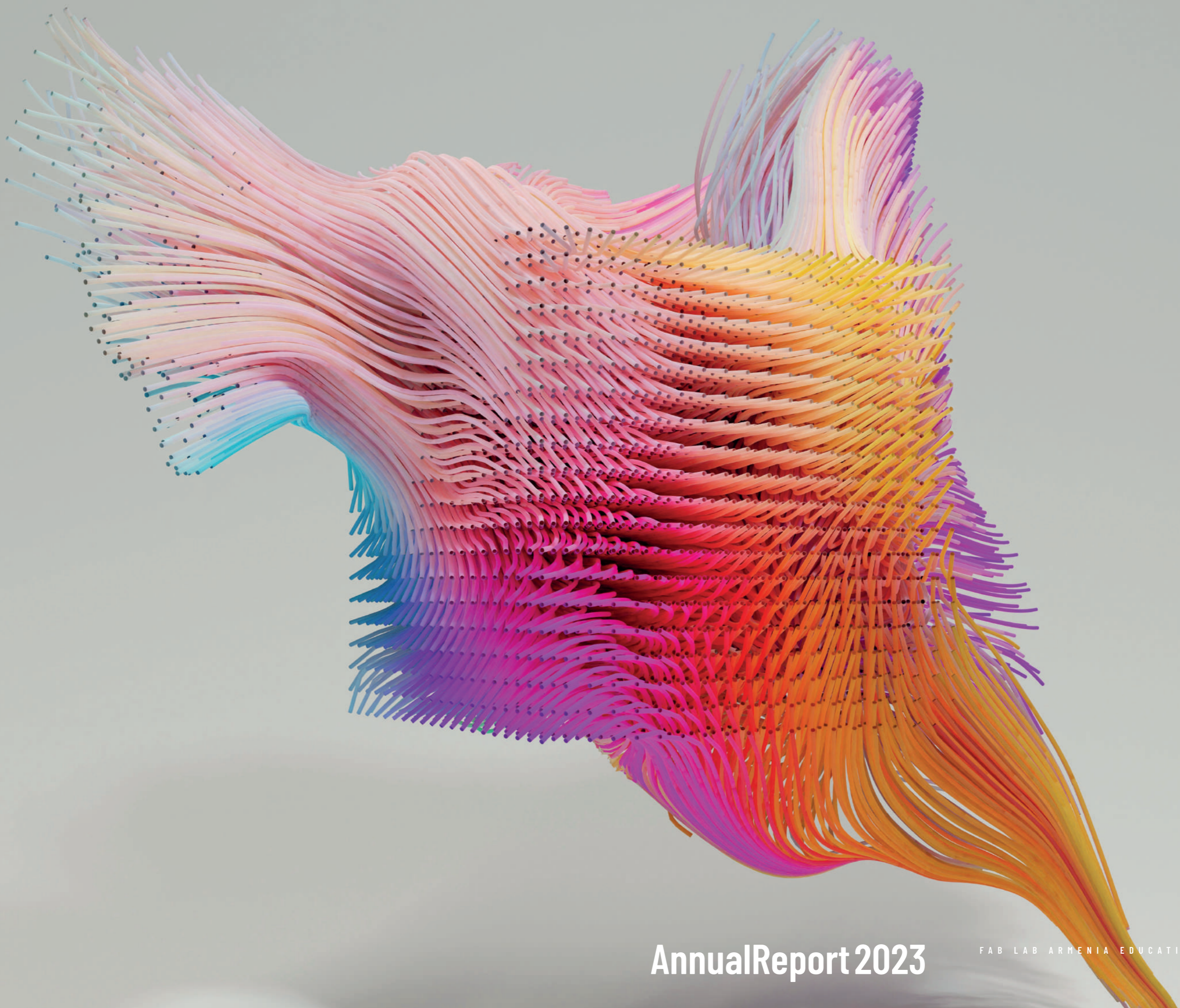


**FAB LAB
ARMENIA**
EDUCATION
FOUNDATION

Annual Report 2023

FAB LAB ARMENIA EDUCATION FOUNDATION





AnnualReport 2023

FAB LAB ARMENIA EDUCATION FOUNDATION

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PROLOGUE

Today, everyday objects are increasingly equipped with sensors, microprocessors, and connectivity, allowing them to collect and exchange data. Inert objects can 'think' and engage with their surroundings and each other. Local design and global collaboration are facilitated through digital file sharing via internet downloads.

At the heart of the digital fabrication industry are Fab Labs, fostering a culture of co-creation and knowledge exchange, while Fab Academies impart essential skills blending science and expertise. Digital fabrication democratizes creation by providing individuals of diverse backgrounds and ages with tools, shared knowledge, and open-source networks, empowering them to bring their visions to life.

Fab Lab Armenia is an integral part of the extensive network led by the MIT Center for Bits and Atoms and the global Fab Foundation, comprising over 2,800 Fab Labs worldwide. This network offers unparalleled access to advancing knowledge across various fields, empowering individuals to move swiftly from ideation to rapid prototyping and market realization. Each day, approximately 250 individuals, ranging from seasoned professionals to beginners, converge to collaborate and innovate.

Fab Academies play a pivotal role in fostering distributed research and education focused on Constructionist Learning and Digital Fabrication principles. Tailored to meet the specific needs of communities, governments, and industries, these programs empower participants to master essential skills for innovation and development.

FORWARD

FORWARD FROM THE MEMBERS OF THE EXECUTIVE BOARD

2023 Is A Year of Growth and Transition From Fab Lab Armenia to Fab Lab Armenia Education Foundation

The year 2023 has been a remarkable period of growth and transition for Fab Lab Armenia as it evolves into the Fab Lab Armenia Education Foundation. In this foreword, we wish to highlight our significant achievements over the past year and outline future goals and strategies.



NERSES YERITSYAN
DIRECTOR OF INFORMATION SYSTEMS AGENCY OF ARMENIA



ARMEN NURBEKYAN
DEPUTY GOVERNOR OF CENTRAL BANK OF ARMENIA



ANNA GARGARIAN
HEAD OF AGBU-KATAPULT CREATIVE ACCELERATOR PROGRAM



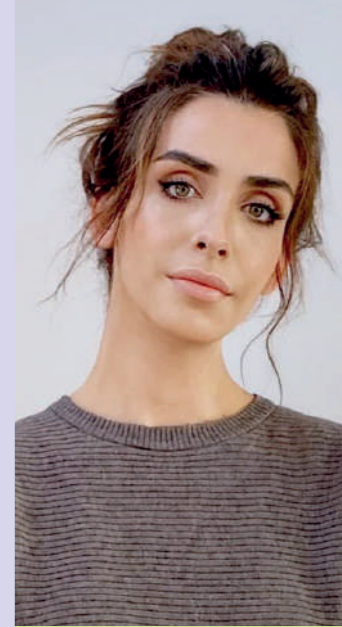
TATEVIK KHACHATRYAN
DEPUTY CHAIRMAN OF THE MANAGEMENT BOARD FOR EVOCA BANK



JACQUELINE KARAASLANIAN
CEO AND CO-FOUNDER OF LEARNING LEARNING ARCHITECTS LLC.



MICHEL DAVOUDIAN
CEO OF APAGA TECHNOLOGIES AND BOARD MEMBER OF COIFA FRENCH-ARMENIAN CHAMBER OF COMMERCE



LINN PARAVYAN
SERIAL ENTREPRENEUR AND EXPERT IN STRATEGY DEVELOPMENT
FOUNDER AND CEO OF OWS THINK TANK

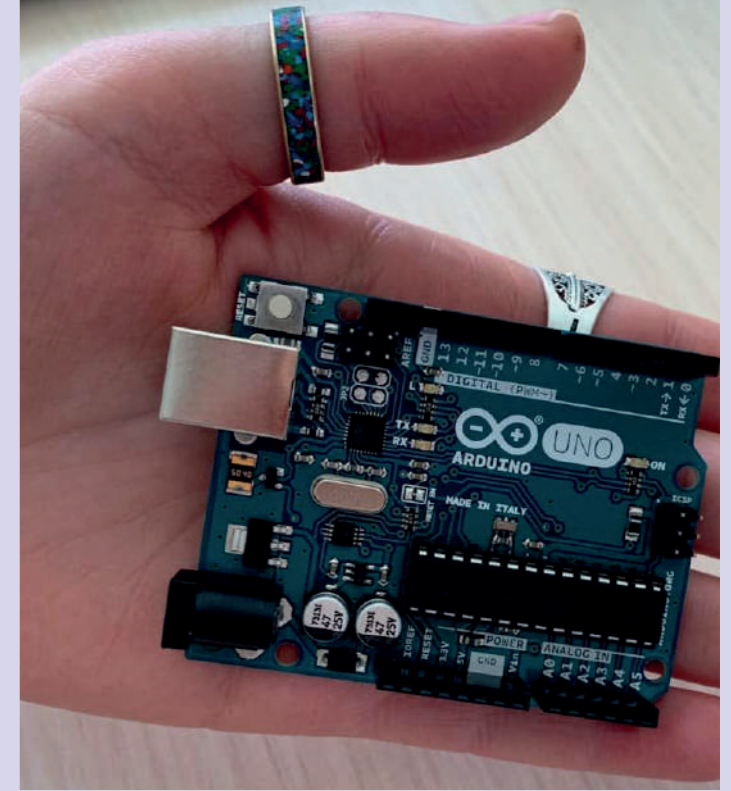


ARA BARSAM
GLOBAL EXECUTIVE DIRECTOR OF CHILDREN OF ARMENIA FUND

FROM FAB LAB ARMENIA DILIJAN TO FAB LAB ARMENIA EDUCATION FOUNDATION: A JOURNEY OF INNOVATION AND IMPACT



↑ Work by Misha Liberte, an artist seamlessly bridging the physical world and the Metaverse. 'Slonik the Elephant' is both a physical and digital creation, raising awareness about the urgent need for wildlife conservation and environmental protection.



↑ A custom microelectronic board, demonstrating engineering prowess and digital fabrication skills. This intricate creation embodies the transformation of an idea into reality through hands-on design and precise tooling.

A Transformative Year for Fab Lab Armenia's Evolution

2023 stands as a significant milestone in Fab Lab Armenia's journey. This year heralds a period of substantial growth and transformation, culminating in the evolution of Fab Lab Armenia into the Fab Lab Armenia Education Foundation. This pivotal change reflects our commitment to expanding our impact and deepening our mission to foster innovation, education, and community development.

A Legacy of Innovation

Fab Lab Armenia has long been a beacon of creativity and technological advancement. Since its inception, it has served as a hub where individuals of all ages and backgrounds could access state-of-the-art tools, resources, and knowledge to bring their ideas to life. Our lab has been a catalyst for numerous projects, fostering a spirit of innovation and collaboration among our participants.

The Transition to an Educational Foundation

Recognizing the growing need for structured educational programs and a sustainable model for nurturing future innovators, we have transitioned into the Fab Lab Armenia Education Foundation. This strategic shift allows us to broaden our reach and enhance our offerings, providing more comprehensive educational resources and opportunities.

Expanded Educational Programs

As the Fab Lab Armenia Education Foundation, we are dedicated to expanding our educational programs. These programs will include a diverse range of workshops, courses, and collaborative projects designed to equip participants with essential skills in science, technology, engineering, arts, and mathematics (STEAM). Our aim is to cultivate a new generation of thinkers, makers, and problem solvers who are prepared to meet the challenges of the future.

Community Engagement and Partnerships

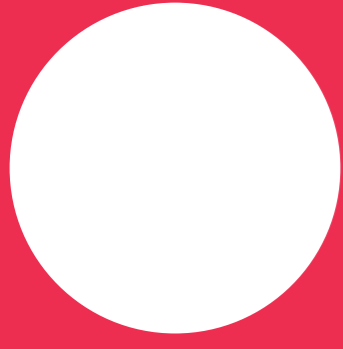
Our transformation into an educational foundation also emphasizes our commitment to community engagement. We will continue to collaborate with local schools, universities, and organizations to create inclusive learning environments. By forging strong partnerships, we aim to make our resources more accessible and impactful, ensuring that the benefits of our programs reach a wider audience.

Looking Ahead

As we embark on this new chapter, we are filled with optimism and excitement for what the future holds. The Fab Lab Armenia Education Foundation is poised to become a leading force in educational innovation, driving positive change within our community and beyond. Join us on this journey as we continue to empower individuals, inspire creativity, and build a brighter future together!

↓ At Fab Lab Armenia, children acquire technological literacy, empowering them to transform ideas into tangible prototypes while engaging in hands-on, applied science.





PART ONE

FLAGSHIP PROGRAMS

1

FAB ACADEMY

Armenia's Fab Academy students are immersed in the rigorous MIT FAB Foundation program, facilitated by Fab Lab Armenia. Fab Academy serves as a globally distributed campus dedicated to mastering the art of digital fabrication, where participants learn to conceptualize, prototype, and document their ideas. Through mastering digital fabrication tools, students transform code into tangible objects, culminating in the Fab Academy Diploma, which consolidates various Fab Academy Certificates based on acquired skills.

Each week at Fab Academy, students undertake a new project, meticulously documenting their progress to build a comprehensive portfolio of technical achievements. Located at Fab Lab Armenia - Dilijan, the program combines MIT's online education with hands-on guidance from Babken Chugaszyan, the Regional Instructor collaborating closely with Prof. Neil Gershenfeld at MIT's Center for Bits and Atoms.

In 2023, Fab Lab Armenia has enrolled four students in the MIT/ Fab Foundation Fab Academy program, with additional support from instructor Onik Babjanyan, himself a Fab Academy alumnus, enhancing the learning experience. The Fab Academy Students are Anoush Arshakyan, Rudolf Igityan, Maxime Richard and Derenik Danielyan.

Three Fab Academy students graduated in July 2023, one Derenik Danielyan did not graduate and will need to go through a second pool of training.

Fab Academy for Up-skilling the Workforce and Education Systems.

Fab Academy is a diploma-granting program, the Boston Fab Foundation issued and validated by Professor Niel Gershenfeld, founder and Head of the MIT Center for Bits and Atoms. The course content is comprehensive, with clearly defined learning outcomes and assessment criteria that facilitate effective evaluation. Graduates of the Fab Academy are well-prepared to enter the rapidly growing workforce in digital fabrication education and industries.

Fab Academy is a uniquely designed, in-action Constructionist Learning Methodology carried out by the Central Mother Hub of Fab Foundation and the MIT Center for Bits and Atoms. It is the original design of Professor Niel Gershenfeld, whose MIT Flagship course "Building Almost Anything" has been democratized and implemented through

a distributed learning infrastructure available to over 2,800 Fab Labs around the world.

Fab Academy is an online distributed learning and teaching curriculum that requires in-lab experience.

Fab Academy emphasizes immediate and systematic implementation of every learning unit, with theories and examples shared and demonstrated over the networks.

The Fab Academy ecosystem is composed of students, instructors, lecturers, technical support, and coordination teams. Their collective knowledge and experience form a cohesive global network.

The Curriculum of the Fab Academy has two main components:

A Zoom conference system and a project management system.

The Zoom conference system

It broadcasts lectures and allows live communication between the Fab Academy lecturers and the students in the nodes. In addition, experienced Fab Academy instructors, both local and regional, utilize it to provide tutoring to Fab Labs with less experienced instructors.

The cloud-based project management system

It serves multiple purposes:

- Students learn to document their work to revisit what they produce and learn to store their data.
- This information is deployed into a website to build the students' portfolios.
- Students are encouraged to ask questions from any member of the network.
- The regional instructors coach the students and secure the coordination of the Fab Academy distributed knowledge (e.g., additional links to learn more, get context, understand certain processes) and secure important communication (e.g., change in the schedule of the classes, recalling rules of the course);
- Fab Academy provides feedback and assessment to each student.
- Instructors and the coordination of Fab Academy use the system for internal communication.
- These last four purposes are implemented through online forums.

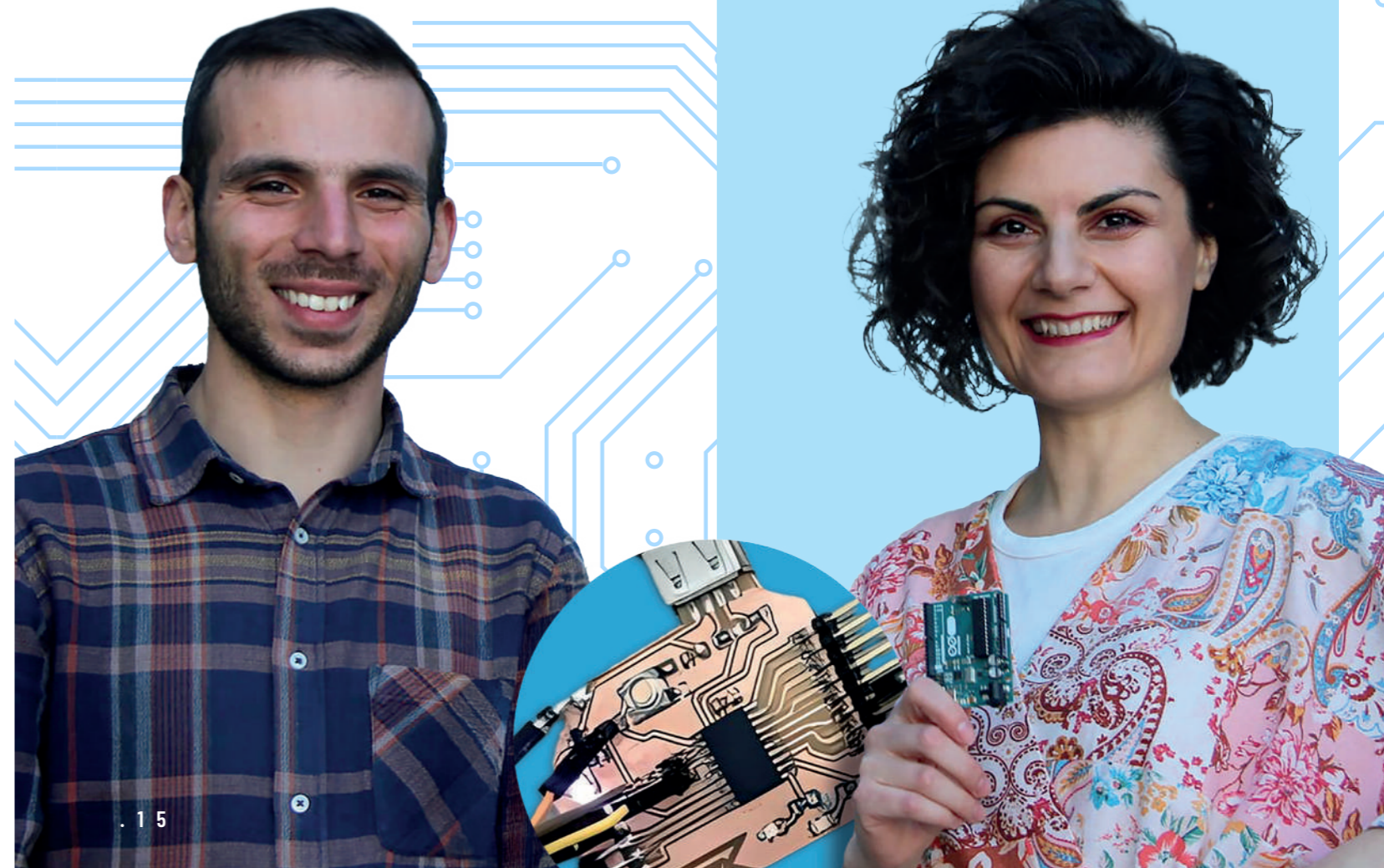
The network actively develops and tests the two-way video/ audio connection between MIT-lecturer and Fab Lab nodes offering Fab Academy. Limitations of classroom interaction are tackled using a network of Local Instructors working with the students, supported, and supervised by more experienced Regional Instructors online. Challenges of class administration are reduced by online content of examples and wiki pages, as well as documentation of (other) students' projects.

The aim of the regional groups within the infrastructure of distributed learning is to facilitate knowledge sharing among Fab Labs within the same region while leveraging the expertise of seasoned instructors.

The students are physically in the same location as the Local Instructor. The remote Regional Instructor is an experienced instructor nominated by the Fab Academy coordinator to assist Fab Labs without experienced instructors (i.e., with more than four years of experience).

Regional Instructors provide support both to students and Local Instructors. The regional group is formed by a group of

Onik Babajanyan mentors Anoush Arshakyan and Fab Academy students, guiding them to explore and create with electronics using an Arduino board.



Fab Labs, thus having several instructors, including at least one instructor with Regional Instructor level experience. Communication occurs asynchronously via issue trackers within the project management tool (GitLab), expanding in scope over time. An online evaluation platform is employed to assess students' documentation against a predefined assessment rubric. Feedback is provided directly through the platform. Initially, only Local Instructors assess students' progress. As students advance and show potential to complete the course, experienced Global instructors are invited to join the evaluation team.

Learning Content Development and High-Quality Standards and Monitoring

Courses about Digital Fabrication and how it supports STEAM education at all levels, research labs, start-ups, and more are now integrated into universities' curriculums.

An inspirational example is the University of Oulu, Finland, Digital Fabrication is already a mandatory class and a basic study for Computer Science and Engineering students.



Fab Academy students actively collaborate on individual and group assignments, highlighting the value of shared learning and experimentation.



Fab Academy for digital fabrication is also offered as an optional course to students from all other faculties of the university. It has several introductory elements of Fab Academy. The course is performed in teams of four students. Teamwork allows for peer support and learning to co-create, collaborate, and learn through loud thinking. This is the basis for research and entrepreneurship skills. Finland has already extended Digital Fabrication education to all high schools in the country.

Tangible Deliverables

- The device must be built into the course.
- The documentation of the process and the final presentation must show and describe its essence in only two or three slides to summarize the whole process and the project very much in the spirit of what you need to do when you file for a patent.

For example, think of what you would need to do if you were filing a Patent for your product. You would need drawings, which are one-to three-graphic representations that offer

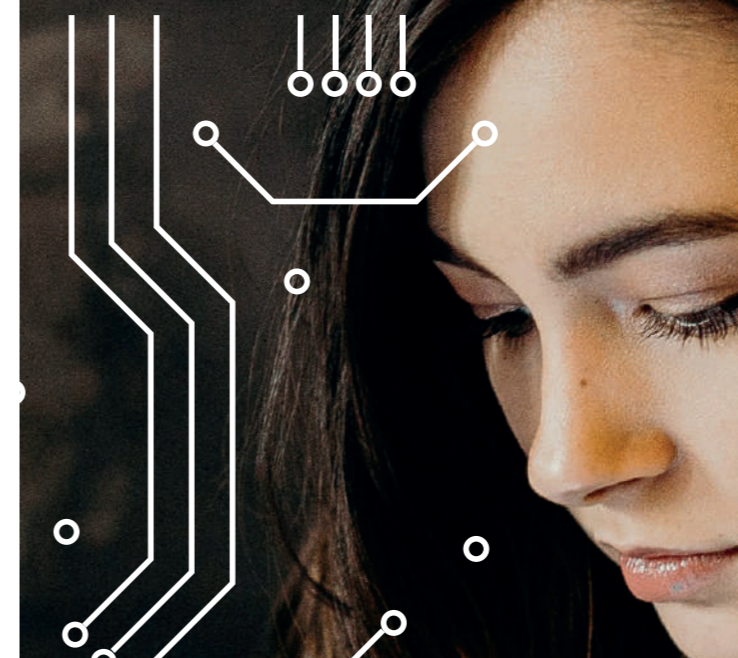
a visual guide that details the invention's unique features, how it operates, and how it can be manufactured and produced. The drawings are then supported by thorough technical documentation of the process.

- The topics can depict anything from simple mechanical devices to complex technological systems, architectural structures, or intricate chemical compounds.

The primary purpose of these illustrations, in this case for the Fab Academy submission, 3 slides and a 30-second video, is to make the invention easier to understand, supplementing the often technical and complex written description.

Project requirements for the device built during the course:

1. It must consist mostly of parts (solid and electronic) a student has designed and manufactured in a Fab Lab,
2. It needs to have moving parts that are controllable by programming. That is, it should have at least one actuator,



Each week, students are reminded that it's unnecessary to re-document material that has already been covered. Instead, they should concentrate on the current topic of study. Since learning builds progressively, so should the documentation. In Fab Academy, students complete weekly group projects with support to learn design rules, safety, and process basics. They collaborate with instructors and document their work. Additionally, each student tackles individual projects to design and build customized electronic boards, integrating microcontrollers and sensors. The entire process must be documented, from concept to functional product.

Fab Academy's weekly workshops cover broader tasks, such as using various tools for Computer-Aided Design, where students model a potential final project (raster, vector, 2D, 3D, render, animate, simulate, etc.) and post it online. They explore and document multiple programs, selecting those that best suit their needs. During the "3D Scanning and Printing" week, students learn 3D-scanning techniques and design rules for 3D printing, creating objects that can't be easily made with subtractive processes.

Learning Outcomes and How to assess your own project before submission.

The learning outcomes focus on mastering digital fabrication processes in the Fab Lab. Students learn to design mechanical parts using CAD for 3D printing or laser cutting, build basic electronic circuits, and control physical objects with microcontrollers. They also develop skills in creative design and team-based problem-solving.

In the Fab Academy Assessment Guide, students follow a checklist for evaluation. For example, during Output Week, students must:

- Describe their design and fabrication process with words/ images/screenshots or reference previous examples.
- Explain the programming used and how the microcontroller datasheet guided them.
- Identify problems encountered and solutions.
- Provide original design files and code.

The evaluation involves checking 85 items, with a FAQ section addressing common areas of confusion from previous years.

Fab Academy Supports Hybrid STEAM Education at all levels of schools to universities.

Fab Academy can be compared to a master's level program, both in the rigor of its applied research and the depth of hands-on learning it offers. Originally developed from MIT's course "How to Build Almost Anything," it has since evolved to span a wide range of knowledge domains and is now adaptable to all educational levels, from high schools to universities.

Online distance education's primary challenge and advantage lies in maximizing the learning and collaboration potential of a global network of experts across diverse fields. Fab Academy offers a unique opportunity to enhance the quality of educational resources for teaching and learning. This network provides expertise and promotes best practices for peer support, particularly aimed at training new educators.

Local Instructors play a key role by offering face-to-face guidance, helping to alleviate some of the difficulties associated with online and distance learning.

- such as a motor or servo, that controls the circuitry and provides feedback for precise position, speed, and acceleration control. The device receives a signal (usually PWM), adjusts movement based on feedback from a sensor, and is commonly used in robotics, RC systems, and automation.
- 3. It must have at least one sensor, and the software needs to react to its readings.

The Fab Academy schedule averages twenty lectures, nine recitations, and four possibilities for a final presentation.

Golden Rules to Fab Academy's weekly hands-on tasks in Fab Labs.

Commercial microcontroller boards are not allowed. In Fab Academy, students have to make their own versions of electrical control boards. The produced result should have at least one sensor, and the software needs to react to its readings.



Fab Academy emphasizes Distributed Learning, fostering personal growth and co-creation. At any moment, approximately 250 practitioners actively exchange knowledge and ideas.

Together, the global, regional, and local instructors provide a comprehensive support system equipped with the tools to deliver high-quality distributed education that empowers students to excel in any subject.

Evaluation:

One of the MIT/ Fab Foundation Fab Academy's core strengths is its rigorous and collaborative evaluation process. Students are assessed by a global network of evaluators comprised of experienced Fab Academy instructors with a minimum of four years in the program. This shared experience across the network enhances the consistency and top quality of the evaluation process. Additionally, peer support plays a key role, particularly in helping newer Fab Academy nodes refine their operations.

This collaborative evaluation process fosters high standards extending beyond the classroom to influence the broader Fab Lab community.

Fab Academy serves as a foundational platform for reskilling the workforce across various industries and countries, equipping individuals with the essential skills to thrive in a rapidly evolving global landscape.

Timeline: Fab Academy is a six-month-long journey from January to July.

Mid-January: One week Initiation and online Bootcamp

Third week of January: Classes Start!

20 consecutive weeks of learning different topics and projects: 3D printing, laser cutting, electronics production, and more. In parallel to each week's learning, the students must finish a project and document it on their own website.

The Fab Academy Program issues a series of certificates that align with various skills and competencies required for digital fabrication. These certificates are typically issued for individual modules or "weeks" within the Fab Academy curriculum.

Here are the 20 key certificates typically offered:

1. **Principles and Practices:** Understanding digital fabrication tools, processes, and principles.
2. **Project Management:** Using collaborative tools to manage and document projects.
3. **Computer-Aided Design (CAD):** Mastering 2D and 3D design software.
4. **Computer-Controlled Cutting:** Skills in laser cutting, vinyl cutting, and CNC cutting.
5. **Electronics Production:** Designing and fabricating printed circuit boards (PCB).
6. **3D Scanning and Printing:** 3D modeling and fabrication using additive manufacturing technologies.
7. **Electronics Design:** Creating schematics and designing electronic circuits.
8. **Computer-Controlled Machining:** Mastering CNC milling machines for precision cutting.
9. **Embedded Programming:** Programming microcontrollers for specific functions.
10. **Molding and Casting:** Techniques in creating molds and casting materials into shapes.
11. **Input Devices:** Integrating sensors into projects to measure external parameters.
12. **Output Devices:** Working with actuators, displays, and other output systems.
13. **Composites:** Creating objects with composite materials (e.g., fiber and resin).
14. **Networking and Communications:** Building communication systems for digital devices and networks.
15. **Interface and Application Programming:** Creating user interfaces and applications for digital projects.
16. **Mechanical Design:** Designing mechanical parts and assemblies.
17. **Machine Design:** Creating machines from scratch using digital tools.
18. **Wildcard Week:** Exploring unconventional fabrication processes, often tailored by instructors.
19. **Invention, Intellectual Property, and Business Models:** Understanding legal, business, and intellectual property concepts for innovation.
20. **Final Project:** Demonstrating the integration of skills through a comprehensive final project, where participants design and build a fully functional prototype.

These certificates represent the mastery of various digital fabrication technologies, which is essential for completing the Fab Academy diploma.

Weekly On-line Hours: (Armenia (GMT+4)

Wednesdays 6 pm-9 pm. Global Review and Lectures

Tuesdays and Wednesdays 4 pm-5 pm. Regional Reviews

Many of the Fab Labs in the network also offer a schedule of different and additional tutorials to support new learners.

NOTE: At any given hour, some 250 people in the network of 2,800 fab labs worldwide exchange ideas and collaborate.

KIDS LAB

ANNUAL REPORT 2023



FAB LAB ARMENIA EDUCATION FOUNDATION

KID POWER
At Fab Lab Armenia, kids lead their own learning and become technologically fluent to create and solve real-world challenges. Inspired by MIT Professor Seymour Papert's constructionist learning approach, we empower children to shape the future!

TEACH TO LEARN/LEARN TO TEACH

Teaching to Learn and Learning to Teach (TTL & LTT)

This is a program deeply rooted in Research and Development at the intersection of Artificial Intelligence, Child Psychology, and Cybernetics. Fab Lab Armenia programs hold at their core the methodology developed over the lifetime work of MIT Professor Seymour Papert. He was one of the founding fathers of AI and a pioneer of technology and constructionism applied to education. Papert extensively explored the intertwined concepts of “learning to teach” and “teaching to learn” as part of his philosophy on education, where active involvement in learning processes is central. Here is how these ideas fit into his thinking and methodology that runs through all Fab Academy programs. AI is closely related to how we understand learning and cognition, which is where child psychology comes in. Child psychology focuses on understanding children’s mental, emotional, and developmental processes, studying how they learn, think, and grow.

Cognitive Development: How children acquire, process, and use knowledge, a domain largely shaped by developmental psychologists Jean Piaget.

Social and Emotional Development: How children form relationships, understand emotions, and develop empathy.

Learning and Behavioral Processes: How children learn through interaction with their environment, including the role of language, play, and education.

Piaget’s stages of cognitive development and various learning theories (e.g., behaviorism and constructivism) are central to understanding how children grow and learn over time. Seymour Papert, a pioneering figure in AI and education, expanded on Piaget’s ideas by integrating them with cybernetics—the interdisciplinary study of systems involving communication, control, and feedback—and with constructionist learning models. This fusion laid the foundation for Papert’s innovative work on using AI in educational contexts, where learners actively construct knowledge through hands-on creation and interaction with technology.

Teaching to Learn

Papert often emphasized that teaching is one of the best ways to deepen your own understanding. This aligns with his belief

Middle school students at Dilijan Central School, guided by Babken Chukaszyan, CEO of Fab Lab Armenia, are mastering reverse engineering. They assembled a life-sized, walking, talking robot made of 1,700 parts and are now disassembling it to enhance the design and build its twin.



that knowledge is actively constructed, not passively absorbed. When individuals teach others, they engage in a reflective process that forces them to clarify, articulate, and restructure their own knowledge. This act of teaching reinforces learning, as it requires the “teacher” to organize information, respond to questions, and adapt explanations based on the learner’s needs. It also encourages iterative thinking, where both teacher and learner constantly revise their understanding. This idea is crucial in Papert’s constructionism, where learning is seen as most powerful when individuals are involved in creating something meaningful. When students teach their peers or even adults, they become active constructors of knowledge rather than passive recipients. The process of teaching becomes a learning activity in itself.



United World Colleges (UWC) students are building skills in digital fabrication while volunteering as mentors to middle school students, teaching applied science. Together, they collaborate on projects that address community needs.

Learning to Teach

In Papert’s view, teaching is not just a transmission of knowledge but a facilitative role that requires learners to be independent, curious, and creative. “Learning to teach” in Papert’s context means creating environments where learners are empowered to guide others, making teaching a shared responsibility rather than a hierarchical one. This idea is embodied in the learning-by-doing approach, where learners take on teaching roles in projects, helping their peers or younger students and fostering a collaborative learning environment. At Fab Lab Armenia, all participants are encouraged to experiment, troubleshoot, and share their learning. This peer-to-peer instruction helps them solidify their

own knowledge and develop communication skills essential for learning and teaching and creating a culture of sharing.

Constructionism empowers learners to take charge of their own knowledge creation, actively shaping their understanding through hands-on experiences and personal exploration.

Papert’s work centers on the idea that knowledge is constructed most effectively when learners are actively engaged in meaningful projects. He argued that both “learning to teach” and “teaching to learn” are natural parts of this process. By making learners responsible for teaching, we create opportunities for deeper engagement with the material. At the same time, learning to teach involves cultivating the skills to guide, mentor, and inspire others to learn, breaking down the traditional teacher-student hierarchy and making learning more collaborative. Teaching to learn allows individuals to reinforce their knowledge through sharing while learning to teach encourages the development of the skills and mindset necessary to foster learning in others. Both are essential parts of Papert’s vision for a more interactive, student-centered educational system.

Seymour Papert’s ideas on “teaching to learn” and “learning to teach” deeply resonate with Neil Gershenfeld’s model of distributed and in-lab learning, especially within the context

of the Fab Lab Network and the Fab Academy. Gershenfeld's vision is rooted in democratizing access to technology and knowledge and fostering a community where learning is hands-on, project-based, and collaborative—much like Papert's constructionist philosophy.

TLL & LTT in a Distributed and Global Learning System

In Gershenfeld's distributed learning model, learners are connected across a global network of Fab Labs, each learning from and contributing to one another's projects. This setup echoes Papert's belief that teaching enhances learning. Students within a distributed system often teach others by sharing knowledge, documenting processes, and troubleshooting challenges, consolidating and deepening their understanding.

Fab Academy students worldwide are required to publicly document their weekly progress, forcing them to reflect on and explain what they have done. This documentation is a form of teaching to learn—students are effectively teaching the global community (and future learners) by sharing their experiences, mistakes, and breakthroughs. When they explain their work, they reinforce their own knowledge and sometimes even discover gaps in their understanding.

TLL & LTT: Online and In-Lab Learning, Teaching and Sharing

In-lab learning is a key feature of Fab Labs; students learn by making, experimenting, and collaborating on projects. The labs provide a physical space where learners can tinker with digital fabrication tools and engage in practical, hands-on activities. Within this environment, learners often take on the role of teachers, guiding others through the use of machines, software, or processes. This peer-teaching is central to the learning experience in a Fab Lab, just as Papert envisioned with learning to teach—where guiding and mentoring others enhances one's expertise.

For example, in the Fab Academy, more advanced students or alumni often take on the role of instructors or mentors. They learn to teach by helping newer students navigate the complexity of digital fabrication, troubleshooting, and problem-solving. This mutual learning relationship reflects Papert's constructionism, where both the student and the mentor are engaged in the project-building process.

Teaching in this context is not about one-way instruction but about helping others discover their own solutions through active making.

Distributed Learning and Teaching System

Papert's constructionist approach fits seamlessly with Gershenfeld's distributed learning framework, where learning is decentralized and collaborative. In the global Fab Lab network, learning is driven by real-world projects that matter to the students and their communities. Learners from different labs collaborate and share knowledge across

geographic boundaries, embodying the principle that everyone is both a teacher and a learner. They contribute to a collective pool of knowledge, making the learning process not only individual but also communal and iterative. This global sharing mirrors Papert's belief that learning happens best when individuals are engaged in meaningful, shared creation. Gershenfeld's vision makes every student in the Fab Lab network both a contributor and a receiver of knowledge. Whether someone is in Armenia or Japan, they are connected through common projects, shared documentation, and collaboration, all of which involve teaching and learning at every level.

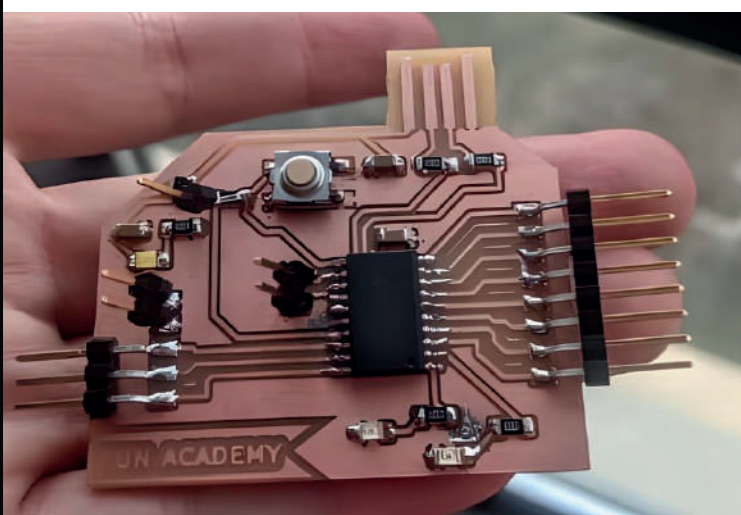
In-Lab Learning and Active Creation

In the physical labs, learners build, create, and problem-solve in real time. As Papert emphasized, learning by doing is the most effective way to engage learners deeply. In this model, the hands-on projects that Fab Academy students undertake involve both designing and fabricating things that matter to them. In doing so, they often teach each other how to use tools or how to approach a design problem. The knowledge transfer here is fluid—students who master one tool or skill quickly become the "teachers" for others in the lab. Like Papert's vision of learning spaces, Fab Labs are designed to break down the traditional roles of "teacher" and "student." Everyone in the lab, including facilitators, mentors, and peers, is actively engaged in learning by making and teaching by showing others how to make.

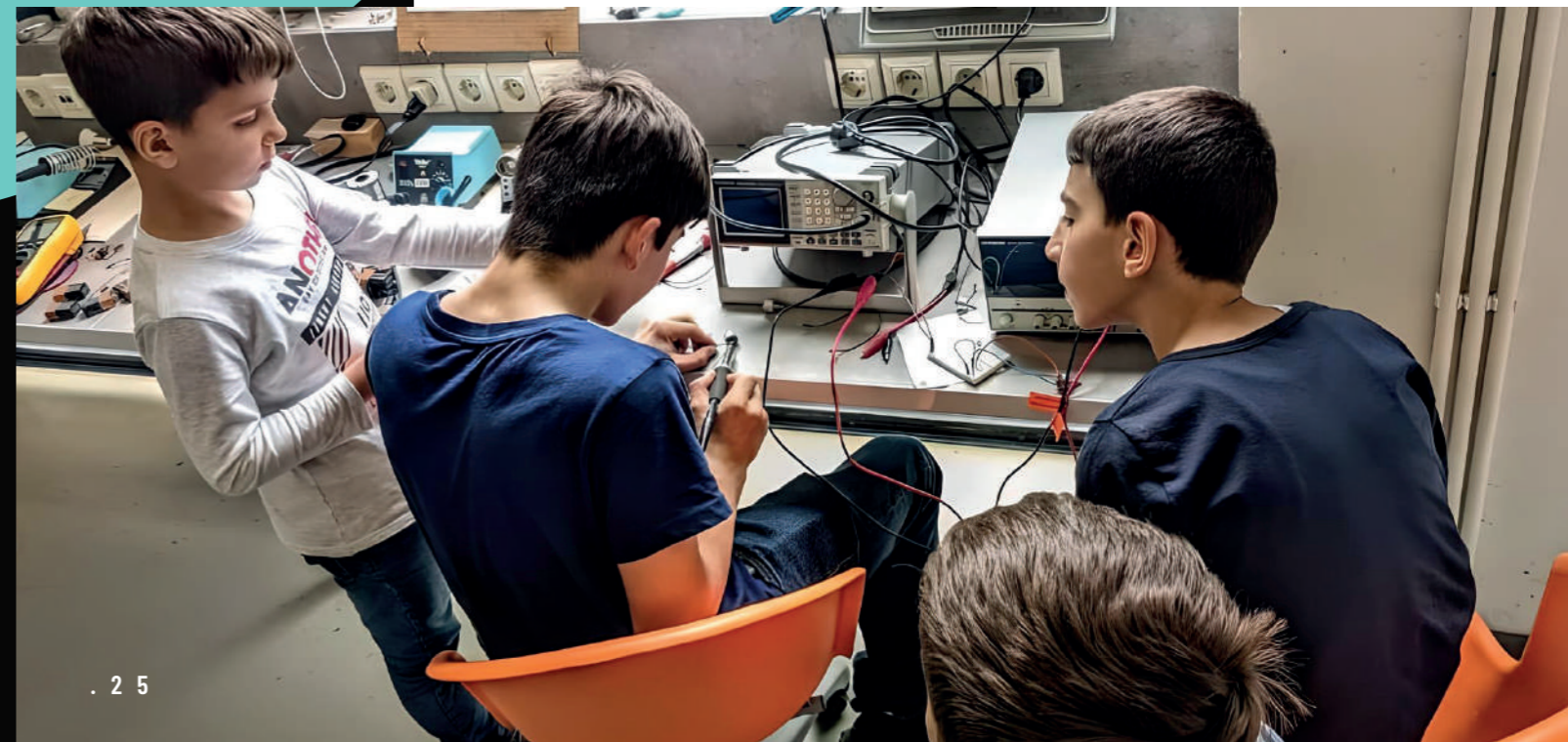
The "Papert-Gershenfeld" Convergence

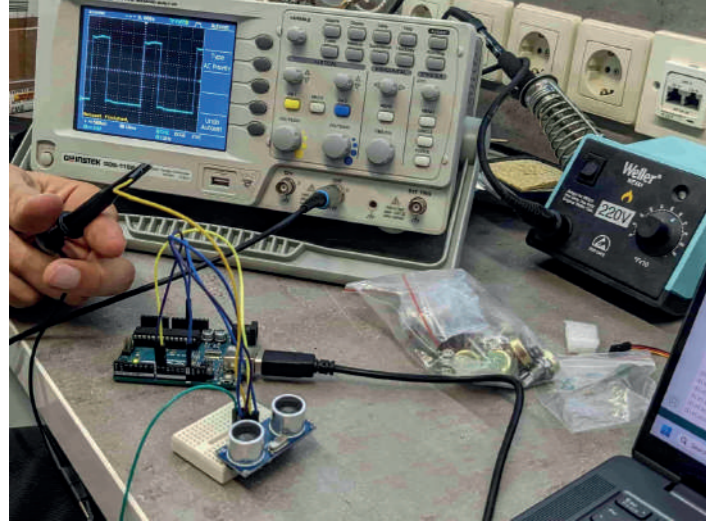
In combining distributed learning and in-lab and hands-on learning, Neil Gershenfeld's Fab Lab model aligns with Papert's principles of teaching to learn and learning to teach. By emphasizing hands-on creation, collaboration, and shared knowledge, the Fab Labs foster an environment where learners are empowered to both teach and learn in real-time, fluidly transitioning between roles. These practices deepen individual learning and contribute to the global community of makers, advancing the shared goal of democratizing technology and knowledge through constructionist education.

By breaking the traditional grade and age divisions, Fab Lab Armenia fosters a more inclusive, dynamic, and supportive learning environment where every student—regardless of age—has the opportunity to both teach and learn from their peers.



← At Fab Lab Armenia, we empower learners to master electronics design and programming, bridging the digital and physical worlds. By exploring the vast potential of the Internet of Things, we unlock innovative opportunities for real-world applications.





↑ Digital fabrication tools empower creativity through experimentation and rapid iteration, transforming abstract ideas into tangible solutions.

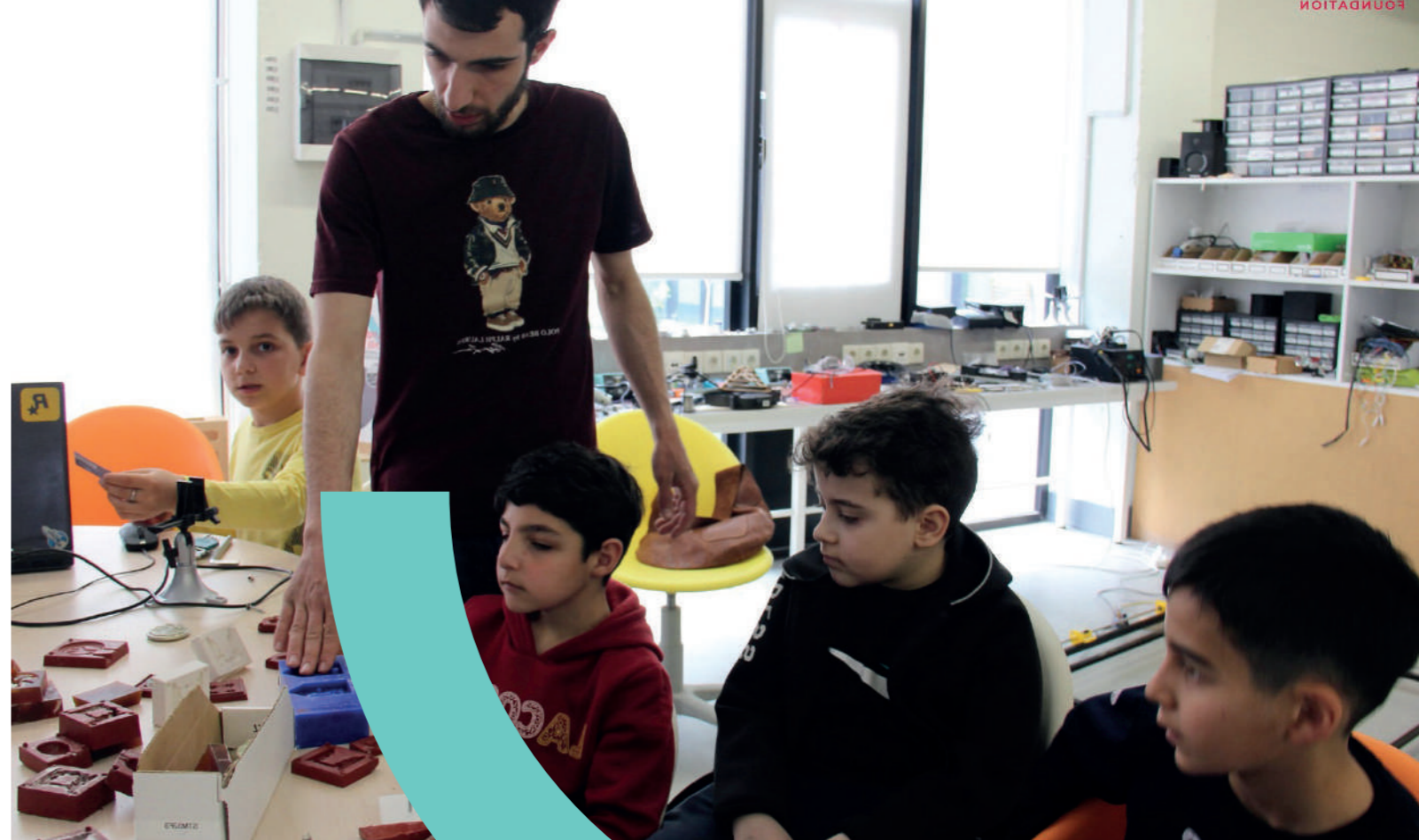
Cultivating Skills in Inventing and Entrepreneurship.

The concepts of “learning to teach” and “teaching to learn” are crucial in cultivating the emerging skills of inventing, entrepreneurship, and innovation. When students take on teaching roles, they reinforce their understanding and develop essential skills such as problem-solving, creativity, and collaboration. This active engagement fosters an environment where entrepreneurial thinking thrives, empowering learners to become inventors and innovators who can apply their knowledge in practical, meaningful ways. By encouraging this dynamic exchange of knowledge, educational practices help shape the next generation of thinkers and creators, equipping them with the skills necessary to address real-world challenges and contribute to a rapidly evolving economy.

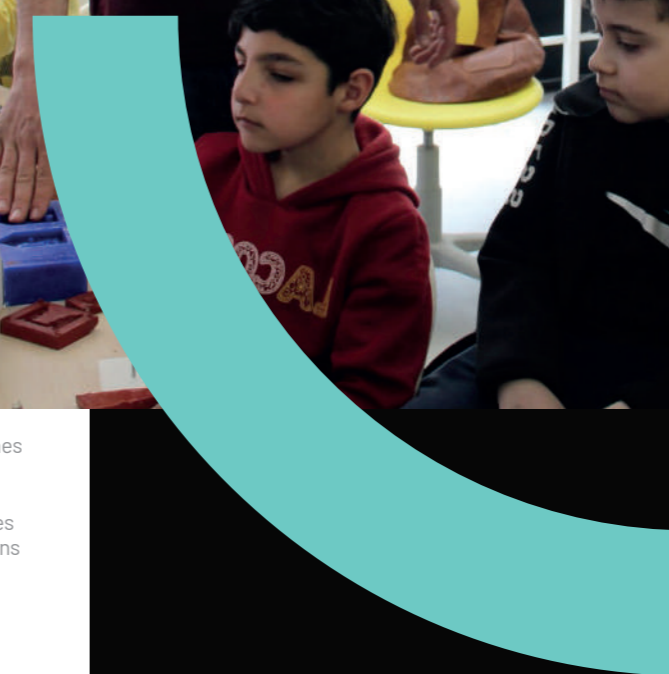
Nurturing our Natural Curiosity and Need for Meaningful Connections.

Learning and the need to share what we find special, new, and exciting are intrinsic parts of being human; they are natural processes that unfold throughout our lives. From our earliest experiences as children to our later years, we are driven by a fundamental curiosity to understand ourselves and the world around us. This curiosity is not just a fleeting interest but a vital need that fuels our desire to explore, question, and engage with new ideas and perspectives. In a rapidly changing world, continuously developing our skills is essential. Lifelong learning allows us to adapt, grow, and thrive in various environments—be it personal, professional, or societal. As we pursue knowledge and mastery in different areas, we equip ourselves to tackle challenges and seize opportunities that arise. This commitment to learning fosters resilience and innovation, enabling us to contribute meaningfully to our communities and society at large. The need for learning transcends individual

growth and serves as a powerful means of weaving connections with others. We create bonds that strengthen our communities by sharing our knowledge, experiences, and insights. Engaging in collaborative learning fosters a sense of belonging and mutual support, as we recognize that each person’s contributions enrich our collective understanding. As we navigate the complexities of modern life, the skills we acquire through continuous learning empower us to address global challenges. Whether through formal education, informal gatherings, or digital platforms, we can engage with diverse cultures, ideas, and experiences. This interconnectedness helps us develop empathy and a broader perspective, reminding us of our shared humanity.



↑ Ashot Margaryan teaches children mold making and metal casting, foundational techniques with diverse applications in art, manufacturing, and product design.



↓ Circuit design blends creativity, technical skills, and problem-solving to create and test functional circuits using components like resistors and capacitors.



Learning and Sharing are lifelong endeavors that nurture our innate curiosity and equip us with the skills necessary to connect with others. Through this ongoing journey of discovery and growth, we contribute to a more informed, compassionate, and vibrant society.

STORYTELLING AND SHADOW THEATER

Empowering Young Minds: Where Imagination Meets Digital Fabrication

Fab Lab Armenia is also a world of fairy tales and miracles. Discover the magic of digital fabrication tools in bringing landscapes and characters to life for storytelling. Guided by Anoush Arshakyan, Creative Content Developer at Fab Lab Armenia, this program ignites children's imaginations and invites them to explore their creativity.

Children are empowered to express their unique perspectives on the world and envision how they can shape it

At our Storytelling workshop, our motto is simple yet powerful: Imagine and Create! Here, children design the heroes of their stories and transform them from imagination into reality using the Fab Lab's state-of-the-art equipment. During the workshop, children aged 4-10 engage with various activities and equipment, including:

- Choosing their story's heroes and cutting them out using a laser cutter
- Painting and shaping their characters
- Inventing fairy tales and bringing them to life through shadow theater performances

This creative journey not only nurtures kids' creativity but also involves teachers and parents, inspiring them to become active participants and learners alongside their children.

Using Fab Labs to create shadow puppets offers teachers a dynamic and imaginative way to unlock children's creativity, emotions, and storytelling skills.

Introduction to Shadow Puppetry

The journey begins with an introduction to the rich history and storytelling power of shadow puppets, spanning across different cultures. Teachers ignite excitement by showing examples through videos or images, piquing students' curiosity. Children are then encouraged to explore personal themes—fears, dreams, and experiences—opening the door to deeply meaningful storytelling through shadow puppetry.

Designing the Puppets

Next, these ideas are transformed into visual designs. Students brainstorm characters and stories, sketching



↑ City Design for a Shadow Theater Stage.

their visions on paper. They reflect on how their personal emotions and experiences can take shape in the characters they create. With access to Fab Lab materials—such as acrylic sheets, cardboard, and even 3D printing supplies—students learn to use design software to craft their puppets. Each design becomes a unique expression, with experimentation in textures and features to reflect their stories.

Fabrication Process

The magic of fabrication follows. Guided by teachers, students use laser cutters or 3D printers to transform their digital designs into physical puppets. Precision and safety are emphasized throughout the process. Once the pieces are ready, students assemble their puppets by adding movable



↑ Children 3D drawing, lazer cutting and assembling their imaginary world.

parts, using brads or strings, and embellishing them with colors and textures, bringing their creations to life.

Creating the Stage

Every puppet show needs a stage. Students design shadow stages using simple materials like cardboard or fabric, considering how the setup can enhance their storytelling. They explore various lighting techniques—from flashlights to LED lights—to create the perfect shadow effects for their performance.

Story Development

With puppets and stages complete, it's time to develop the story. Students write short scripts or create storyboards

that weave together their characters and themes. The focus is on dialogue, action, and emotional depth. Rehearsals help students refine their narratives and sharpen their shadow puppetry techniques.

Performance and Reflection

The project culminates in a performance, where students present their shadow puppet plays to an audience of peers or parents. This public showcase builds confidence and enhances public speaking skills. After the performance, students reflect on what they learned about themselves and each other. They discuss how their stories connect to their personal experiences, fostering empathy and emotional understanding.

Exploration of Emotions

Through their puppet stories, students explore themes deeply tied to their lives—fears, dreams, and aspirations. This opens a safe space for discussions about emotions and coping strategies, helping students express and understand their feelings.

Cross-Disciplinary Connections This project merges art, design, and technology, underscoring the power of integrating different subjects. In addition to developing creativity and technical skills, it encourages social-emotional learning by fostering personal narratives and building empathy among peers.

By leveraging Fab Labs' resources, this shadow puppetry project enhances children's creative and technical skills while providing a meaningful platform for them to express their innermost thoughts and emotions in an engaging, imaginative way.

A Holistic View of Human Evolution: Thinking, Playing, and Creating

Reflecting on how humanity has evolved in knowledge, play, and creation, we can consider three interconnected dimensions: Homo Sapiens (the thinking human), Homo Ludens (the playing human), and Homo Faber (the maker of tools).

In today's world, these layers overlap more than ever. Humans are constantly learning (Sapiens), experimenting and playing (Ludens), and creating new technologies (Faber)—whether in the fields of AI, education, or digital fabrication. This blending of thinking, playing, and making is part of a continuous cycle of human evolution.

This holistic understanding is particularly relevant in today's interdisciplinary world, where design thinking, experiential learning, and human-centered innovation merge these layers to address global challenges. Rethinking education, technology, and culture in this way can help us build a future where humans thrive as learners, players, and creators.

COMMUNITY OUTREACH PROGRAMS



Fab Lab Armenia nurtures a vibrant community by fostering collaboration, innovation, and education through volunteer projects, the Mothers' Club, and family-oriented activities. It champions sustainability and acts as a dynamic hub for partnerships that drive cutting-edge innovation across Armenia.

EMPOWERING CHANGE: THE ROLE OF VOLUNTEERS AND PARENTS IN SHAPING PROJECTS

From Digital Designs to Heartfelt Gifts: A Parent's Creative Journey

Home expertise in using digital fabrication tools helped coach newcomers and guide them in their individual projects. Here is a gallery of some of their projects designed and narrated by Nanor Kassabian.

Parent Project /Bunny Holders.

My journey into the world of laser-cut creations began with the charming Bunny Holders. With Easter approaching, I felt inspired to create something uniquely personal for my son and our family – a project that would stand out from store-bought items. Searching for inspiration online, I discovered two delightful bunny designs.

I downloaded the designs and meticulously adjusted their dimensions to match my vision, infusing each with my own creative touch. With everything prepared, I embarked on the laser-cutting process. As the laser was being intricately etched away, my anticipation grew and I was eager to unveil the final result.

As the last piece fell into place, the bunnies came to life, and a profound sense of joy and accomplishment washed over me, reflected in the wide smile on my face. To enhance their charm, I carefully selected vibrant colors to paint the bunnies, giving them a lively, almost magical appearance for

my son. On Easter morning, they would hold a delightful array of colorful eggs and chocolates.

When Leo, my son, received my handcrafted gift, his eyes sparkled with excitement and gratitude. "Wow, Mommy! You did an incredible job! Well done!" His words encapsulated everything, igniting a renewed determination to dream up fresh projects, conceive new ideas, and bring them to life.

Parent Project / Ballerina Napkin Holder

I searched the internet for inspiration, hoping to find a unique and uncommon design for gifts. That's when I stumbled upon the concept of a balletic napkin holder, instantly capturing my interest.

I took this concept and modified it to bring in my personal creative touch. I adjusted the measurements and incorporated new design elements. The first attempt proved somewhat difficult and unsuccessful. I gave it a second try with a few refinements. Success!

The result left me beaming with satisfaction, and I couldn't wait to present it to my mother. She absolutely adored it!



↑ Ballerina Napkin Holder



↑ Alphabet Puzzle

Tic-Tac-Toe

Designed as a laser-cut board game, Tic-Tac-Toe offers children a delightful activity in the Fab Lab, encouraging creativity and game design. It's immensely gratifying to see my creation bring joy to others as they engage with it.

Math Puzzle

As someone who found traditional math teaching methods uninspiring as a child, I crafted the Math Puzzle to transform learning into an enjoyable experience. Beyond teaching numbers and calculations, it cultivates essential skills such as logic, pattern recognition, and critical thinking. This project not only enriches the educational resources available at the Fab Lab but also fosters a playful approach to learning math.

Alphabet Puzzle

Inspired by my trilingual 4-year-old son, Leo, I created the Alphabet Puzzle to make learning letters and words engaging and effective. Handcrafted from start to finish, this puzzle exemplifies how teaching a foreign language can be both enjoyable and impactful. Each meticulously designed piece reflects my dedication to creating a learning tool that captivates young learners' imaginations.

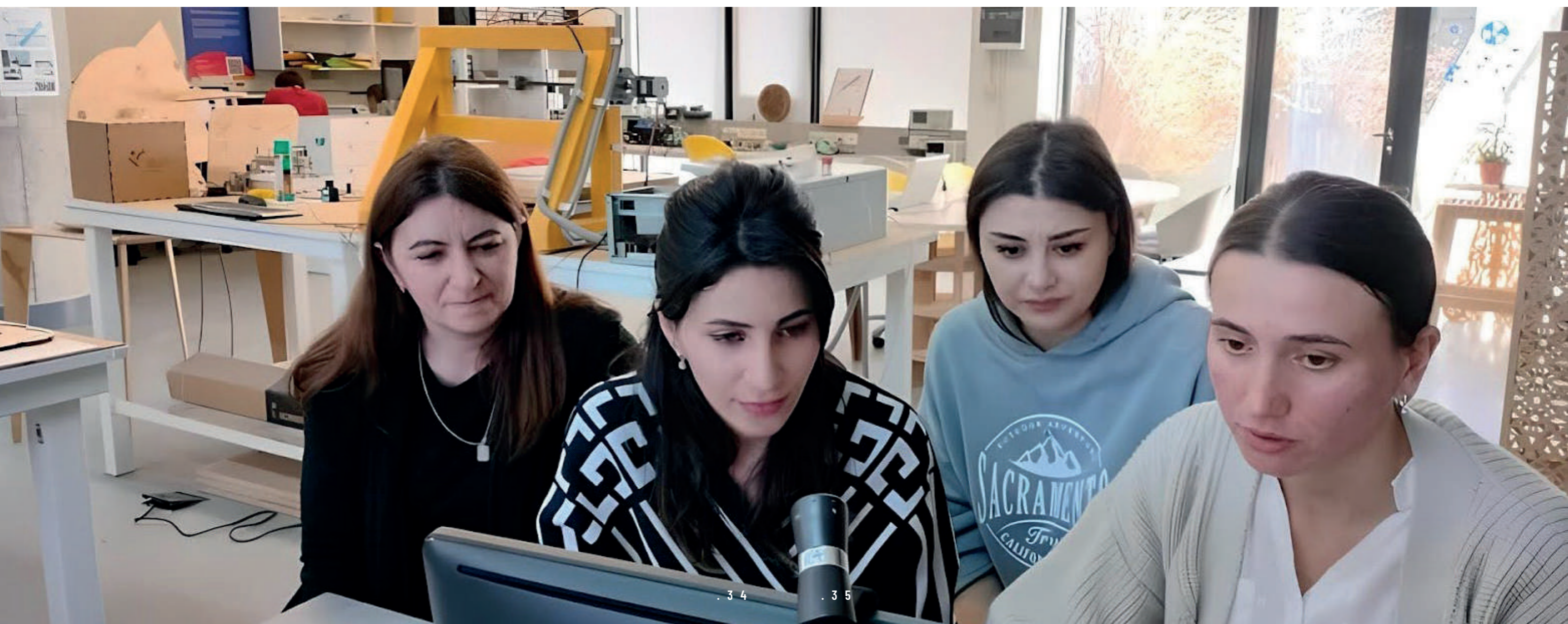
Parent Project / Educational Puzzles - Create your own games

Fruit Puzzle

I envisioned the Fruit Puzzle as a catalyst for Dilijan's kindergarten teachers to explore innovative teaching methods using the Fab Lab. By incorporating vibrant shapes and colors, I aimed to harness children's natural affinity for visual and colorful stimuli, creating an engaging learning experience.

MOTHERS CLUB AT FAB LAB ARMENIA

Arpine Saghatelyan, a volunteer at Fab Lab Armenia, decided to gather a group of young, creative mothers to design educational tools to support elementary school teachers of the Central School in Dilijan. Arpine showed them how to 3D design and model their imagined education products and how to connect to digitally controlled lazer cutters and the CNC machine to carve through wood.



SATURDAYS ARE FAMILY TIME AT FAB LAB ARMENIA: A PLACE FOR PEOPLE OF ALL AGES AND WALKS OF LIFE



↑ Co-creating and enjoying each other's inventiveness can lead to some truly inspiring outcomes.

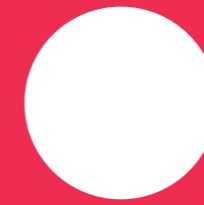
Family Workshops

Batik Making Merges the Arts and Technology and Delights Participants of All Ages.

At Fab Lab, we witnessed the captivating fusion of art and technology through two concurrent workshops. One workshop delighted 5- to 6-year-old children from ABC preschool, where they explored the vibrant art of warm batik techniques guided by Dilijan Art School teacher Anna Ghazaryan using a laser cutter to create intricate designs. Simultaneously, parents engaged in crafting plaster and clay chests and plates, embellishing them with exquisite Armenian decorations, mentored by art teacher and artist

Mher Ghazaryan These sessions not only sparked creativity but also showcased how art and technology can intertwine to inspire both young minds and adults alike.

At Fab Lab Armenia, our intergenerational workshops transcend mere skill acquisition; they foster meaningful connections. Here, the wisdom of older generations intertwines with the fresh perspectives of youth, sparking synergies that birth innovative ideas and solutions. Amidst shared laughter, participants of all ages revel in the joy of experimentation and the fulfillment of bringing ideas to life.



Access to Resources:

Just as libraries provide access to books and information, Fab Labs offer access to sophisticated software and computer-controlled tools such as 3D printers, laser cutters, and electronics, enabling hands-on learning and innovation.

Community Engagement:

Both Fab Labs and libraries foster community involvement. They provide a space for people to come together, share ideas, and collaborate on projects, promoting social interaction and community building.

Learning Opportunities: Fab Labs offer workshops, classes, and events that promote skill development, much like libraries provide educational programs and literacy initiatives. This focus on lifelong learning is central to both environments.

Creativity and Innovation:

While libraries support knowledge acquisition, Fab Labs emphasize creation and prototyping, encouraging users to turn their ideas into tangible products. This shift from consumption of information to production of knowledge is a key difference.

Inclusivity:

Both spaces aim to be inclusive, welcoming people of all ages and backgrounds. Fab Labs, in particular, often target underserved communities, providing access to technology and fostering skills that can lead to new opportunities.

Interdisciplinary Collaboration:

Just as libraries support a wide range of subjects, Fab Labs encourage interdisciplinary projects that combine art, technology, science, and engineering, creating a dynamic environment for innovation.

Local and Global Community Building:

Fab Labs seamlessly integrates digital and physical elements and spaces, enabling community members to engage both online and offline. The digital aspect includes tools like CAD software, open source, online tutorials, and collaborative platforms that facilitate the easy exchange of ideas and resources. This virtual interaction connects participants from various geographic locations, allowing them to share insights and collaborate on projects, thereby breaking down traditional barriers of distance and accessibility.

Overall, Fab Labs represent a modern evolution of the library concept, blending education, creativity, and community in a way that aligns with the needs of today's society.



↑ Older Children share their experiences and guide the younger ones. They reinforces their own learning, while younger children bring fresh perspectives and creativity that challenge and inspire their older peers. Building hands-on projects together fosters teamwork, problem solving, and a sense of shared accomplishment.

These hands-on workshops are crafted to celebrate the boundless nature of creativity, rejecting age as a barrier to innovation. They champion inclusivity, collaboration, and the collective experience, ensuring every participant feels valued and inspired. Ultimately, they showcase the transformative power of creativity and connection, demonstrating that when generations unite, limitless possibilities unfold.

Today Fab Labs are becoming " the New Libraries" They are the modern Community Hubs and often share space with existing libraries. They are about a community coming together to learn, create, share, and collaborate.

SATURDAYS FOR COMMUNITY

MEMBERS SHARING KNOWLEDGE

Fab Labs: Cultivating Collective Intelligence through Shared Knowledge and Collaboration

The ethos of Fab Labs encourages sharing resources, knowledge, and skills, aligning with French Philosopher Pierre Lévy who gives a definition of Collective Intelligence as a social phenomenon. This culture of sharing fosters an environment where individuals feel empowered to contribute their unique insights, ultimately leading to more robust and innovative solutions that benefit the entire community.

Fab Labs embody the principles of collective intelligence, which thrives on shared knowledge, collaboration, and creativity. They create inclusive environments where both local and global participants can engage meaningfully, transforming ideas into tangible projects that positively impact lives and communities.

Communities Promote Learning by Example

This is a cognitive and educational concept where individuals gain knowledge and skills by observing and imitating the actions or behavior of others. It is based on the idea that seeing a demonstration or real-life example of a task can provide a clearer understanding of how to execute that task instead of learning solely through theoretical explanations or abstract instructions.

This approach taps into the brain's natural ability to recognize patterns, absorb information, and apply it. Here are a few elements that expand on the idea of learning by example:

Modeling Behavior:

People often learn new skills by watching others perform them. In education, for instance, a teacher demonstrating how to solve a math problem step-by-step allows students to follow that example. The process involves both observation and then application of what was learned.

Apprenticeship Approach:

Traditional apprenticeship models, where novices learn trades by working closely with a more experienced person, are prime examples of this method in action. Here, the learner gains practical, hands-on experience by directly observing and imitating their mentor.

Children Learning by Imitating Adults:

In social and developmental psychology, especially in childhood development, imitation plays a critical role.

↓ A community volunteer parent and expert in 3D modeling and laser cutting is mentoring a group of young students, guiding them through their projects with hands-on support and advice.



Children often mimic the actions of their parents, peers, or even media figures, which helps them acquire language, social norms, and basic skills.

Example-Based Learning in AI:

In Artificial Intelligence, "learning by example" is a core principle in supervised learning. AI models are trained on example data (input-output pairs) and learn to predict outcomes based on that data. Over time, the model becomes more accurate as it encounters more examples.

Constructionist Learning:

As promoted by educators like Seymour Papert, this method allows learners to construct their understanding by actively engaging with real-life examples. Instead of passively absorbing information, learners experiment, observe outcomes, and adapt based on what they see.

Collective Intelligence emerges when individuals contribute their unique insights and skills towards common goals, facilitated by technological platforms that enable open collaboration and knowledge sharing. Fab Lab Armenia exemplifies this by fostering communities that co-create solutions, learn from each other, and collectively advance innovation and social impact, irrespective of physical distances. Thus, they serve as hubs where digital capabilities enhance traditional community-building efforts, leading to a more connected and empowered global network of creators and innovators.

Some Contributors to the Fab Lab Armenia Community of Dilijan

Ilya Avryanov, a volunteer to share knowledge and expertise in Virtual machines – Linux – Python programming offered an introduction to complex systems for the community.

Kirill, an avid supporter of Makers Spaces in Moscow, recently moved to Dilijan. He offered a special workshop on how to make "brain puzzles" for a fun science exploration through digital fabrication.

Ashot Markaryan, an industrial fabrication specialist based in Yerevan, came to Fab Lab Armenia to teach and demonstrate new mold-making techniques.

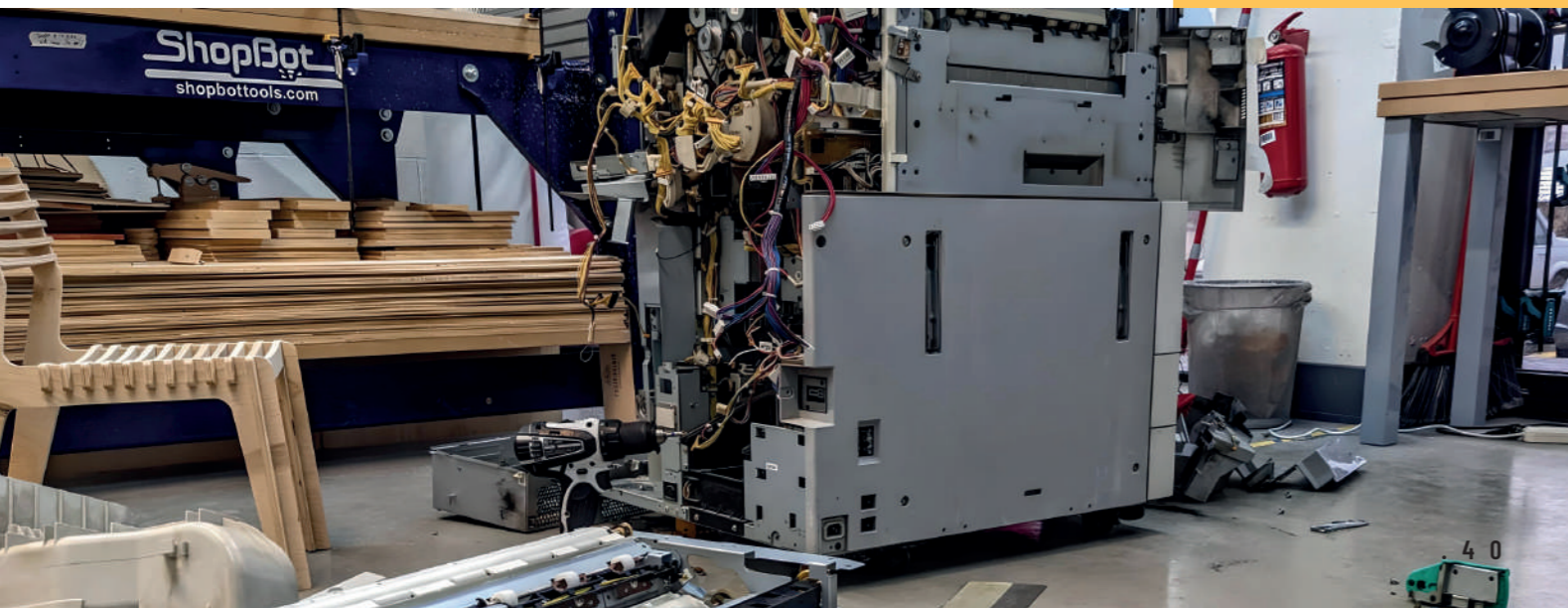
RECYCLING: YESTERDAY'S TECH, TODAY'S INNOVATION

The Science of Recycling Old Tech for Innovation: A Civic Duty Made Fun and Creative for All

Fab Lab Armenia has been at the forefront of recycling old technology, championing sustainable practices for years. We enthusiastically take apart obsolete computers, printers, and other electronic devices, meticulously separating them into their core components. This process uncovers the fascinating intricacies of machine deconstruction and plays a crucial role in minimizing electronic waste, which has become a significant environmental challenge. By repurposing old technology, we take proactive steps to reduce the strain on our planet, offering a tangible way for people to contribute to a greener future.

Deconstructing outdated machines is more than just an environmental effort—it is a creative and educational journey. Each component disassembled offers an opportunity to rethink its original purpose, inspiring individuals to explore innovative ways of reusing, repurposing, and transforming technology. This process encourages participants to see beyond the immediate utility of gadgets, sparking curiosity and a sense of empowerment. It enables problem-solving through hands-on learning and often leads to unique, ingenious solutions.

↓ Disassembling an old printer to salvage its valuable parts for reuse and repurposing.



↑ Repurposing old computers to build new machines

By disassembling old devices, we can breathe new life into them, transforming them into functional tools or even artistic creations. Integrating the science of recycling into everyday life contributes to sustainability and unlocks a world of creative possibilities. The act of recycling becomes a form of exploration, offering a sense of purpose and discovery as we envision new ways to use old materials.

The Fab Lab Armenia team members also collect their used pizza boxes, recycling them in a unique and sustainable way. They transform the cardboard into a paste enriched with plant nutrients, which is then molded into biodegradable containers for new seedlings. Once planted in the ground, these containers gradually disintegrate, releasing nutrients into the soil to support healthy plant growth. This creative approach reduces waste and turns it into something valuable—an innovative example of turning waste into wealth.

Fab Lab Armenia always raises awareness by inviting everyone in the community and the education world to join the exciting journey of discovering the many ways we can all contribute to a future where innovation and environmental responsibility go hand in hand.

Recycling as a Collective Mindset for the Greater Good

MIT professor Neil Gershenfeld, the founder of the Fab Lab

Movement, advocates for a world where every individual has access to the tools and knowledge required to design, create, and innovate. His vision promotes a collective mindset that empowers communities to take control of technology and its lifecycle. Instead of viewing recycling as a passive, obligatory task, he encourages us to see it as a dynamic, creative opportunity—a chance to collaborate, innovate, and build something new.

From A Routine Activity into a World Movement.

When recycling is approached with this mindset, it has the potential to engage entire communities in a shared civil responsibility. It transforms from a routine activity into a movement where individuals contribute actively to technological reinvention. Through distributed production—where everyday people become participants in the creation process—recycling old tech becomes a cornerstone of the circular economy, where waste is minimized, and resources are continually repurposed.

Gershenfeld's philosophy aligns with sustainable fabrication principles, which emphasize reusing, reinventing, and repurposing materials. This approach supports the environment and social progress, enabling people to innovate at every level. It shifts the focus from consumption to creation, where the materials that would

have been discarded are given new life and purpose. This democratization of technology allows everyone to engage in the process of personal fabrication and sustainability, making technology creation more inclusive and collaborative.

It is a Science to Recycle Old Tech for Innovation

The science behind recycling old technology reflects the Fab Lab Armenia Team's larger vision of technological empowerment. Teaching individuals to disassemble, understand, and reconfigure old devices isn't just a technical skill; it's a gateway to innovation. By engaging in this scientific and creative process, individuals learn how machines work and how to think critically and problem-solve. This type of learning transforms recycling from a simple environmental act into an opportunity for education and exploration. It opens up a new way of understanding the life cycle of technology and our role in its evolution.

Fab Lab Armenia offers a space that provides access to advanced digital manufacturing tools to anyone who wishes to come in and learn. People can transform old, discarded components into new, functional innovations. The process of repurposing materials that were once considered obsolete sparks both creativity and education. It invites participants to imagine new possibilities for technology, blending scientific inquiry with artistic expression.

Moreover, recycling for innovation is inherently inclusive. By incorporating design, engineering, and problem-solving elements, the activity becomes fun, engaging, and accessible to people of all ages and backgrounds. Whether it is children learning the basics of electronics or adults finding new uses for outdated devices, recycling invites everyone into the fold. This inclusive approach fosters a deeper connection between people and technology, encouraging them to understand, take action, and shape a sustainable

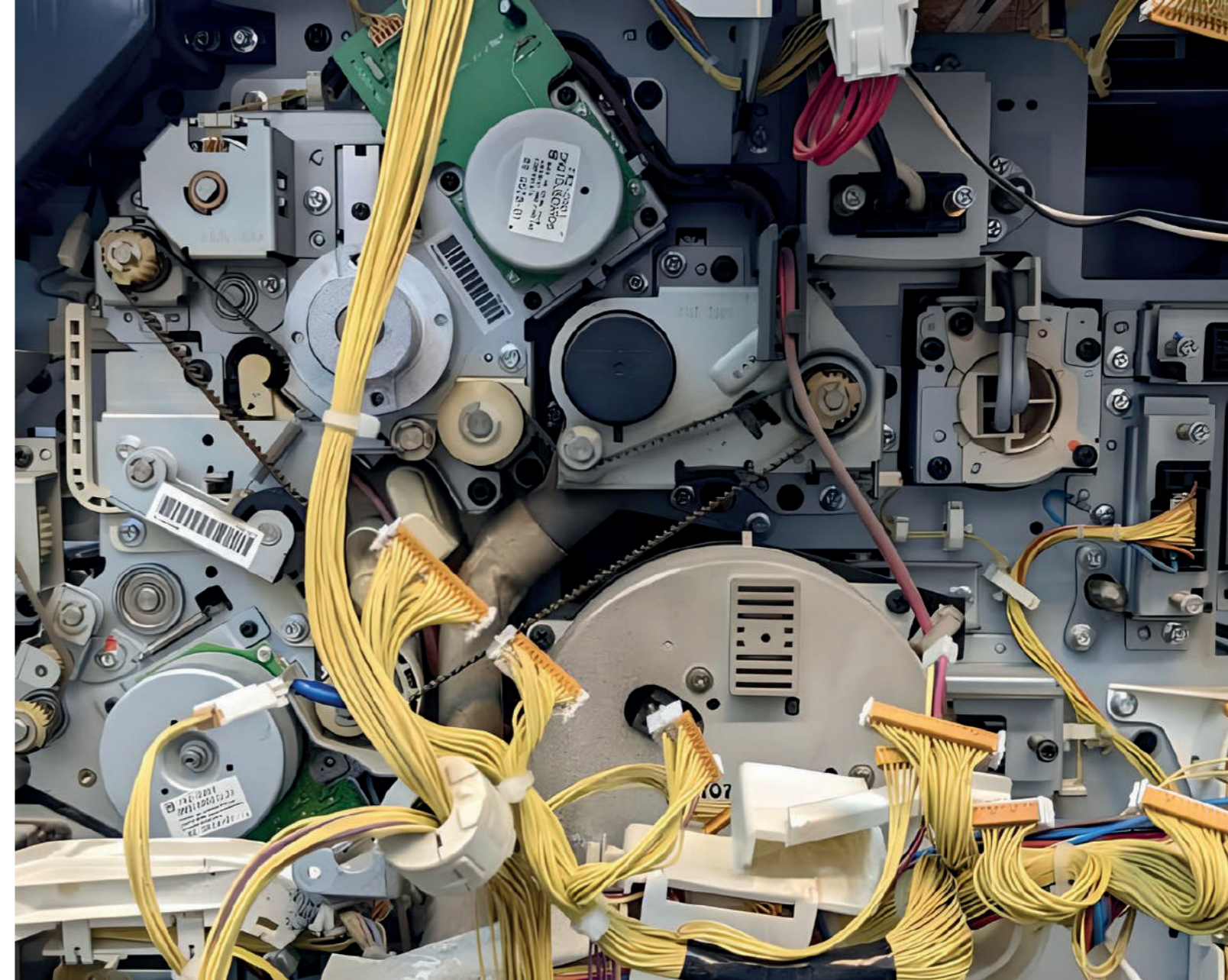
future for us all.

A Civic Duty Made Fun and Creative for All

In order to truly create a better, more sustainable planet, recycling needs to become ingrained in our daily lives as a form of civic duty. Fab Lab Armenia is inviting people to see technology in a new light—not just as something to be discarded when it no longer serves its original purpose, but as raw material for future creations. Instead of starting from scratch, we can innovate by seeing the hidden potential in what already exists, leading to environmentally friendly and resource-efficient innovation.

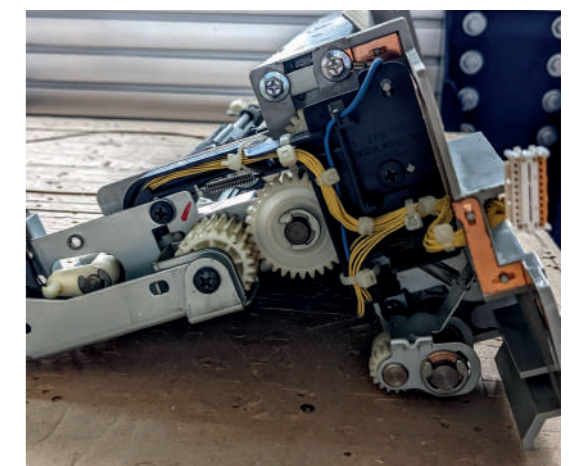
By framing recycling as a creative process, it becomes an activity that people are excited to engage with. The act of repurposing old technology offers a sense of accomplishment and connection to the broader goal of sustainability. When we approach recycling with curiosity and creativity, we become more invested in the process and its outcomes, which in turn makes us more likely to adopt these practices in our everyday lives. The collective effort of many people embracing this mindset can significantly impact the health of our planet.

In essence, Professor Gershenfeld's views on recycling align with his broader advocacy for democratizing technology. By making technology accessible to all, he creates opportunities for everyone to contribute to innovation, regardless of their background or expertise. This approach encourages society to shift its perspective on waste—no longer seeing it as an endpoint but as the beginning of a new cycle of creation and possibility. Through this lens, recycling becomes more than just a responsibility; it becomes a vital and exciting part of technological evolution and environmental stewardship.



↑ Disassembling an old machine is a treasure hunt, combining exploration with research; this process can be incredibly rewarding, sparking curiosity and laying the groundwork for deeper engineering and programming expertise.

↓ Disassembling an old printer to salvage its valuable parts for reuse and repurposing.



FAB LAB ARMENIA HOSTS ARMENIA'S LEADING ORGANIZATIONS AND ENTERPRISES

Members of the Leadership of Evocabank, along with a visiting scientist, are exploring some hands-on product design and digital fabrication.



What seemed like science fiction three decades ago has now become science fact

Already in 1995, In his book *Being Digital*, Nicholas Negroponte, co-founder of the MIT Media Lab, predicted the AI revolution and the inevitable transformation from atoms to bits – the shift from physical to digital – is inevitable and far-reaching. His famous prediction, “Everything that can be digitized will be digitized,” reflects his vision that in the digital age, any form of information or media that exists in physical form (atoms) will eventually be represented in digital form (bits). Here are some key insights that are or are in the process of becoming our reality, all of which are embedded in Fab Lab Armenia’s vision, mission, and implementation.

Information Accessibility

When something is digitized, it becomes accessible from virtually anywhere. Whether it’s a book, a song, or a scientific dataset, digitization allows for instantaneous access. This has revolutionized how we access knowledge, removing many barriers such as location, storage, and time. What once was tied to specific physical objects (like books or CDs) is now available at the click of a button in the form of e-books, streaming media, or online repositories. More recently, this has extended to objects fabricated in a fab lab with digitally controlled machines.

Cost and Efficiency

Digitization drives down costs. Physical items require materials, production, and distribution logistics, all of which contribute to their expense. Digital equivalents eliminate much of these overheads. For example, digitized products like software, e-books, and digital services are infinitely replicable at negligible cost. This also applies to digitizing industries like finance, healthcare, or logistics, where digital processes reduce inefficiencies and operational costs.

Storage and Preservation

Digital formats enable the storage of vast amounts of information in a fraction of the space required by their physical counterparts. This is a key driver behind the digitization of libraries, museums, archives, and media collections. Additionally, digitization aids in the preservation of content that may degrade over time, such as old films, photographs, or paper documents. Bits are far more resilient to time and easier to back up than atoms.



↑ Living Art Labs, France at Fab Lab Armenia in Dilijan.

Living Choreography Project PAR by Efi Farmaki.

Customization and Interaction

Digital products can be personalized in ways that physical objects cannot. Websites can offer tailored content, music streaming services recommend songs based on preferences, and learning platforms can adapt to individual learning styles. This customization is made possible by the malleability of digital bits, which can be manipulated in real time. In contrast, physical products offer much less flexibility.

Globalization and Collaboration

Digitization breaks down geographical boundaries. People can collaborate across continents in real time, which has changed the nature of work, education, and creativity. For instance, massive open online courses (MOOCs) have democratized learning in education. Thanks to digital tools, research collaborations between international institutions are now seamless.

Automation and AI

As more things are digitized, the possibilities for automation increase. AI and machine learning technologies can only thrive in environments where data exists in digital formats, enabling algorithms to analyze patterns, make predictions, and generate insights. Entire industries, from manufacturing to healthcare, are being transformed as digitized data feeds AI-driven automation.

The Shift in Consumer Behavior

Digitization changes how people consume products and services. From printed newspapers and CDs to streaming platforms and e-books, consumers now prioritize convenience, immediacy, and customization over physical ownership. This shift has reshaped publishing, media, and retail industries, forcing companies to adapt to digital-first models or risk becoming obsolete.

From Mass-Manufacturing to Personal Manufacturing.

Today, thanks to Fab Labs growing exponentially worldwide, we can design collectively online and through open-source file sharing and download and produce locally what we need when we need any consumer products that we can adjust and perfect to our personal requirements.

Challenges and Ethics of Digitization

While digitization brings many advantages, it also presents challenges. Issues of privacy, data security, and digital divides need to be addressed. With so much of our personal information stored digitally, there are concerns over who controls it, how it’s used, and the potential for misuse. Additionally, access to the digital world isn’t yet universal, leaving gaps in who benefits from these advancements.

Negroponte’s prediction has played out across nearly every facet of society, and in many cases, its impact has surpassed even his expectations. From personal interactions to business models and global infrastructure, digitization continues to reshape the world.

Fab Lab Armenia: Empowering College Students through Community-Driven Initiatives

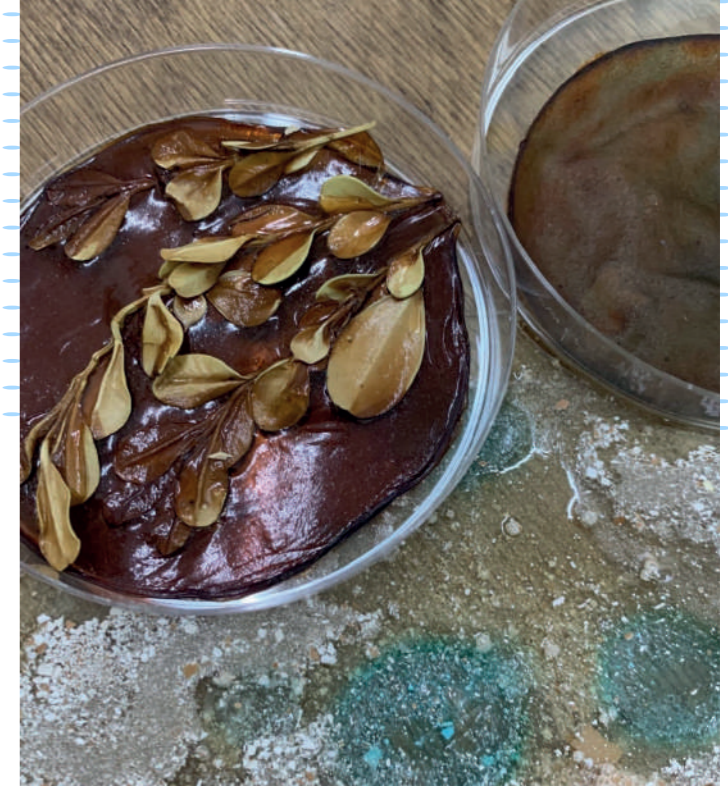
UWC co-founder Veronika Zonabend and colleagues visited Fab Lab Armenia to explore and enhance a collaborative initiative that had naturally begun with UWC students and teachers engaging in prototype construction for theater installations and social projects. These efforts included designing shelters for street dogs and more.

During the meeting, Babken Chugaszyan elaborated on potential collaborations aimed at shaping the future of creativity and innovation in education. He illustrated this vision with concrete examples, highlighting how knowledge is exchanged within a vibrant global network of fab labs, sharing diverse ideas and experiences. Babken showcased projects from MIT Fab Academy programs, emphasizing their role in preparing a skilled workforce and supporting students in their pursuit of higher education.

There is science in everyday life stopping to take notice allows us to do everything better. We coordinate our thinking with our practice and learn through everything we build and create around us.



↑ Project Serenity by Elina Galoyan. A "living" lamp. The light source passes through a layer of bacteria that thrive in a peaceful atmosphere or die when the noise increases.



↑ Creating new Bio-Material

DEMOCRATIZING RESEARCH

Empowering Citizen Scientists: Bridging Research and Community

Fab Lab Armenia is democratizing research by promoting the concept of Citizen Science, empowering individuals of all ages and educational backgrounds to engage in meaningful scientific inquiry. By fostering a curiosity and continuous feedback culture, we ensure that participants remain connected to the latest advancements. To achieve this, Fab Lab Armenia collaborates with leading scientists from around the world, offering courses and training designed to inspire and equip future innovators with the knowledge and skills they need to thrive.

Fab Lab Armenia is about Research in Action.

In both traditional education systems and high-level research centers, there is often a disconnect between research and

meaningful action. The individuals conducting research are frequently disconnected from the practical implementation and real-world application of their findings. This disconnect is a key driver of inertia and a lack of substantial progress in many fields of knowledge. At best, we see only incremental or hesitant changes, as well as poor adoption and implementation of new technologies.

Innovating, inventing, and developing new markets and economies are skills that need to be nurtured from a very early age, starting at kindergarten and elementary school levels. The goal of Fab Lab Armenia is to show how we can bring together Research and Action to work hand in hand at all levels of our education systems and in non-formal learning environments. At Fab Lab Armenia, we celebrate the curious mind and empower people to discover and develop talents they did not know they had.

Research in Actions allows Educators to be lifelong learners themselves while they are showing the path to the younger generations. Learning through research in action goes beyond earning good grades and diplomas for good salaries. Research in action teaches you how to think and design solutions to the most unexpected problems, that the world will keep throwing at us. Research in Action obliges every person and organization to organically look for productive collaborations and the sharing of resources. It is about deep solutions and not temporary fixes. It is about creating a new mindset for growth and a mutually shared purpose for a strong and better future.

It was only natural for Fab Lab Armenia to reach out to the Armenian Society of Fellows (ASOF) and introduce Digital Fabrication and how it can support existing research facilities across educational institutions, universities, and

private industries. Fab Labs worldwide play a crucial role in democratizing the research process by offering rapid prototyping capabilities that are accessible to all.

The emerging field of Digital Fabrication, supported by programs like Fab Academy and a global network of 2,700 Fab Labs under MIT's Research Center for Bits and Atoms, serves as a potent engine for innovation.

These Fab Labs act as catalysts for research, fostering inclusivity by engaging the expertise of a diverse and resourceful community. Participation in research becomes an enriching and empowering journey that transcends traditional academic boundaries.

IDEA EXCHANGE FORUM @FAB LAB ARMENIA

Fab Lab Armenia is an innovative space where individuals can conceive and construct everyday objects capable of sensing and processing information and programmed to autonomously take action. This revolution enables every physical creation to have its digital counterpart.

IDEA EXCHANGE FORUM @FAB LAB ARMENIA



↑ Local and International Members of the Fab Lab Armenia Community come together to imagine our future in the most unexpected, joyful and interesting ways.

The Idea Exchange Forum @ Fab Lab Armenia is a dynamic on-demand program dedicated to promoting innovation, collaboration, and creativity.

Whether you are a student, professional, or simply passionate about learning and creating, the Idea Exchange Forum is the perfect opportunity to expand your horizons, connect with others, and make a meaningful impact in your community. Join us to explore together and transform ideas into action!

Serendipity Encounters and Learning Opportunities and Exchanges of Best Practices.

These are powerful concepts in the world of education, particularly within collaborative and innovative learning environments like the Fab Lab network or constructionist education models.

Welcoming Digital Nomads.

Fab Lab Armenia Created the Idea Exchange Forum to capture the unexpected and wonderful that we all wish to share and or encounter. This is especially true in today's era of digital nomads, who work remotely and rely on technology and the internet while traveling and living in different locations. This lifestyle has become increasingly popular as remote work opportunities have expanded, allowing people to work from anywhere with an internet connection and

access to digital fabrication tools and environments. Fab Lab Armenia is happy to be host to this new generation of Digital Nomads. With them comes serendipity encounters and a wealth of knowledge and practices.

Making room to Welcome Serendipity Encounters and Allow Ourselves to be Amazed.

These spontaneous, often unplanned moments of learning or discovery occur when individuals come into contact with new ideas, perspectives, or people in an open, collaborative environment. They often happen outside structured sessions or formal learning experiences.

Welcoming the Unplanned Interactions: These can happen in casual conversations, during breaks, or while working on unrelated tasks. The informal setting often leads to relaxed, creative exchanges.

Cross-disciplinary Insights: Encounters often involve people from different fields or backgrounds. For example, in a Fab Lab, someone focused on robotics might meet a designer working on fashion, leading to innovative ideas or collaborations.

Enhanced Creativity: Serendipity fosters creativity by allowing for the mixing of ideas and perspectives that would not typically meet in a formal learning setting.

Encouraging Exploration: These moments invite learners to think beyond their immediate focus or field, helping them explore new tools, approaches, and solutions.

Sharing of Best Practices

Sharing best practices is essential for maintaining a community's continuous learning and improvement culture. It refers to the dissemination of effective techniques, strategies, or solutions that have been proven to work in similar contexts.

Benefits of Sharing Best Practices:

- **Accelerates Learning:** When learners share their methods for overcoming challenges, others can avoid pitfalls and speed up their own learning process.
- **Community Growth:** Sharing strengthens the learning community, fostering a sense of trust and collaboration.
- **Innovation Propagation:** The sharing of best practices spreads innovation throughout the community, ensuring that effective solutions are not confined to one individual or group.
- **Encourages Reflection:** Sharing requires learners to reflect on what worked and why, leading to deeper learning and self-awareness.

- **Workshops and Peer Learning:** Creating spaces where learners can share what they've learned, like regular check-ins, informal talks, or formal presentations of progress.
- **Collaborative Platforms:** Using digital tools or physical spaces where ideas, solutions, and feedback can be shared across teams or cohorts.
- **Mentorship Networks:** Establishing mentors who have overcome specific learning challenges to guide new learners.

In environments such as Fab Lab Armenia and its network of innovation-based learning models, combining serendipitous encounters with overcoming learning challenges and actively sharing best practices creates a dynamic ecosystem where learning becomes a continuous process.

It is also an organic way of seeding a new culture. A vivid example of this is the digital nomad lifestyle that represents a blend of professional freedom, personal mobility, and exploration, appealing to those who value flexibility and adventure while maintaining a steady income through remote work. This movement is just starting to take hold in Armenia.

REGIONAL OUTREACH & STRATEGIC PARTNERSHIPS

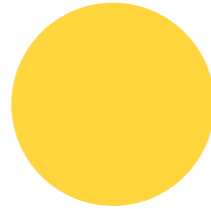


SUPPORTING EMERGING FAB LABS IN THE COUNTRY AND REGIONALLY

↑ Artwork with lace and shadow
;katapult Pavilion 2023

At Fab Lab Armenia, we are dedicated to fostering the growth of emerging Fab Labs through tai-lored content development, localized training, and robust support systems. Our approach navigates key challenges while ensuring alignment with the Fab Foundation's Fab Academy Curriculum, which serves as an essential resource and pillar for growing new Academic content and training.

FAB LAB ARMENIA INSPIRING AND SUPPORTING NEW FAB LABS IN THE REGIONAL NETWORK



Teenagers share their experiences and guide the younger ones. They reinforce their own learning, while younger children bring fresh perspectives and creativity that challenge and inspire their older peers. Building hands-on projects together fosters teamwork, problem-solving, and a sense of shared accomplishment.

Supporting Emerging Fab Labs

At Fab Lab Armenia, we are dedicated to fostering the growth of emerging Fab Labs through tailored content development, localized training, and robust support systems. Our approach navigates key challenges while ensuring alignment with the Fab Foundation's Fab Academy Curriculum, which serves as an essential resource rather than a replacement.

We are currently designing a comprehensive program to assist emerging Fab Labs, addressing challenges at three core levels:

Administration and Management:

Effective management systems are crucial for the success of a Fab Lab. This involves building creative teams capable of delivering tangible, measurable results and fostering strong community engagement. We aim to establish a solid foundation for educational administration that drives impact.

Flagship Programs:

We are committed to launching initiatives that enhance access to digital fabrication and raise awareness of its transformative potential within communities.



↑ Fab Lab Armenia hosted by the Center for Youth Initiatives in Tashkent, Uzbekistan
Jacqueline Karaaslanian with Ornella Mkrtchyan with Members of an International Community of Education and Technology Leaders, April 2023

Capacity Development:

Our goal is to prepare a core group of young experts through Fab Lab Armenia prior to their enrollment in the Fab Academy's annual program, held from January to July. Participants will benefit from guidance provided by Regional Instructors and teachings from MIT Professor Neil Gershenfeld.

Fab Lab Armenia can play a vital role in selecting and hiring the right expertise for the new Fab Lab's core team. We will also design flagship programs that empower participants to effectively utilize new equipment and explore its applications within the local context. Implementing this program prior to the Fab Lab's opening will maximize its effectiveness.

Furthermore, we are committed to providing training that cultivates effective learning ecosystems, promoting growth and innovation with both short- and long-term outcomes. This entails designing projects relevant to local life, culture, and needs.

Our collaboration with the Boston Fab Foundation and selected Fab Labs within the global network of 2,800 labs strengthens our efforts. Leveraging our own successful experiences, we are positioned to support the development of a national network of Fab Labs, as well as assist emerging and regional Fab Labs through the collective knowledge and expertise of the ever-evolving Fab Lab community.

The Case for Uzbekistan.

on April 4, 2023, Jacqueline Karaaslanian, Board Member of Fab Lab Armenia, was invited by Ornella Mkrtchyan founder of the Center for Youth Initiatives in Uzbekistan, to present Fab Lab Armenia and share insights on the new industry of Digital Fabrication. The presentation was focusing on 'Advanced practice-oriented educational technologies' and STEAM Education through Fab Labs.

Led by founder Ornella Mkrtchyan, the Center for Youth Initiatives in Uzbekistan is dedicated to fostering the development and engagement of young people across the country. The organization is home to a new Fab Lab and aims to create opportunities for youth participation in various social, economic, and cultural activities.

The center focuses on empowering young individuals through educational programs, leadership training, and community projects. Its initiatives often include workshops, seminars, and events that encourage civic involvement, entrepreneurship, and skill development.

The center contributes to Uzbekistan's overall growth and modernization by providing a platform for youth to express their ideas and take active roles in society.

As a follow-up to the visit of J. Karaaslanian, the Center for Youth Initiatives in Uzbekistan is currently exploring the possibility of collaborating through training workshops at Fab Lab Armenia to prepare and coach its new staff.

STRATEGIC PARTNERSHIPS

ANNUAL REPORT 2023

FAB LAB ARMENIA EDUCATION FOUNDATION

Fab Lab Armenia views strategic partnerships as essential for fostering innovation, amplifying impact, and achieving shared goals effectively. By combining complementary strengths, resources, and expertise, we work together to tackle complex challenges, extend our reach, and create value that would be unattainable individually. We deeply value these collaborations, which enable knowledge sharing, spark creativity, and deliver cost-effective solutions, driving sustainable growth and resilience in an ever-changing global landscape.

MINISTRY OF EDUCATION OF THE REPUBLIC OF ARMENIA

Collaborative Connections: Fab Lab Armenia's Strategic Partnerships for Innovation and Impact

Fab Lab Armenia is seeking diverse and innovative strategic partnerships, which play a crucial role in the quality of its resource management, research, and projects. Here are some key aspects:

Corporate Partnerships:

Fab Lab Armenia collaborates with various companies across industries, such as technology, virtual learning platforms labs, and more. These partnerships allow companies to get meaningful feedback and insights from Fab Lab Armenia while providing the lab with resources and real-world applications for its innovations.

Academic Collaborations:

Fab Lab Armenia partners with other academic institutions and research organizations, such as the MIT Center for Bits and Atoms and its Fab Foundation, or with the Super Fab Lab of Oulu Finland, which is part of the University of Oulu, to enhance interdisciplinary research and foster knowledge sharing. These collaborations can include joint projects, Instructor boot camps and exchanges, and more.

Government and Nonprofit Collaborations:

Fab Lab Armenia engages with governmental bodies and nonprofit organizations to address societal challenges through technology and design. These partnerships often focus on topics like education, teacher training, and urban development.

Startup Incubation:

Fab Lab Armenia supports startup ventures and entrepreneurial initiatives, often collaborating with incubators and accelerators to foster innovation and support research through quick prototyping to reach the market.

Open Innovation Initiatives:

Fab Lab Armenia promotes open collaboration through initiatives like hackathons, workshops, and challenges that invite participation from diverse stakeholders, including students, professionals, and the public.

International Partnerships:

Fab Lab Armenia has a global outreach and collaborates with international organizations of Fab Labs and universities to address global challenges, leveraging its expertise in technology and design.

The collaboration aims to support STEAM education across all high schools in the country. Fab Labs are emerging as new technological and interconnected hubs that rethink education systems and create new hybrid learning environments at all educational levels.

Today, the challenge is to navigate fluidly between the physical and digital worlds while maintaining excellence.

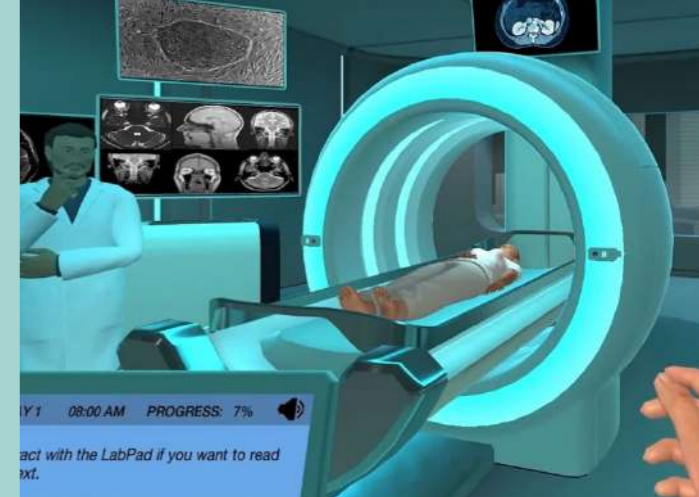


↑ Anoush Arshakyan, from Fab Lab Armenia is welcoming people at the DIGITEC Conference, introducing virtual science labs and digital fabrication.



Students at the elementary school learning to build robots and program them with a behavior and personality. They are learning to embed artificial intelligence in their prototype robot.

LABSTER: ONLINE IMMERSIVE SCIENCE LABS FOR ALL HIGH-SCHOOLS AND UNIVERSITIES IN ARMENIA



↑ Simulations can also be connected to physical prototypes, bridging the gap between digital models and tangible creations. This is particularly effective in fields of robotics or environmental science.



Bridging the Virtual and Physical: Fab Lab Armenia's Partnership with Labster

Fab Lab Armenia has forged a strategic partnership with Labster, the premier provider of online, professional, and immersive science labs. This agreement, signed in November 2023, will bring Labster's cutting-edge virtual learning programs to Armenia starting in January 2024.

Labster is dedicated to offering the highest quality of content and training for educators, and Fab Lab Armenia is proud to serve as the Learning Hub for content localization and support. Through this collaboration, students will have access to Labster's interactive, 3D virtual science labs that bring scientific concepts to life. These online and immersive lab experiences will allow learners to visualize theory, explore state-of-the-art lab environments, and expand their knowledge beyond the traditional classroom, from the quantum realm to the surface of Mars.

By integrating Labster's innovative programs, Fab Lab Armenia aims to enhance school curricula, target specific learning needs, and foster deeper content mastery to prepare the next generation of scientists and innovators.

← Educators can design tailored simulations to match specific curricular goals or student needs, ensuring relevance and engagement

SEEDING THE CREATIVE CULTURE ECONOMY WITH A NEW FAB LAB ARMENIA IN GYUMRI

Cultivating Creativity and Innovation: Fab Lab Armenia's Expansion to Gyumri

Katapult/AGBU/Creative Armenia and The European Union supporting the Creative Culture Industry and establishing a new Fab Lab Armenia in Gyumri.

Katapult/AGBU is the project initiator who facilitates and will fund the new Fab Lab in Gyumri scheduled for 2024. This includes tools, design and layout, space renovation, and transportation and installation. Fab Lab Armenia is the knowledge partner that provides mentors and educators to assist students from the Gyumri State Academy of Fine Arts with their Preparation for Fab Academy studies and provide them with the support needed for the rigorous MIT curriculum starting in January 2025. Fab Lab Armenia also designs ongoing workshops and targeted learning opportunities.

Anush Arshakyan, Fab Academies Support Instructor and Creative Content Developer at Fab Lab Armenia, introduced Digital Fabrication to 150 design students and young professionals who came from all corners of the world and were part of a yearly event of "Meeting of Design Students" (MED) organized by Katapult at the Gyumri Technology Center.

FABICADEMY

Fab Lab Armenia is bringing an additional Educational program to its flagship Fab Academy Program

Fab Lab Armenia's collaboration with the Katapult /AGBU program will create a new Fab Lab in Gyumri, which will be hosted within the State Academy of Fine Art in 2025.

Fab Lab Armenia has started preparing by selecting candidates who will be trained in the art of Fabricademy. This new and added expertise, developed by the Fab Lab Armenia team under Anoush Arshakyan's leadership, will be in the Science of Applying Digital Design and Digital Manufacturing tools and techniques to the Textile Industry.

About the Fabricademy course- Textile Academy's presence in Armenia is more than just education. This course is beyond a harmonious blend of tradition, innovation, and sustainability, crafting a vibrant tapestry of endless possibilities.



↑ New Material Catalog for Digital Fabrication

Preservation of Textile Heritage:

Armenia boasts a centuries-old tradition of textile craftsmanship deeply rooted in its cultural fabric. The Fabricademy program ensures these rich textile traditions are preserved and revitalized by seamlessly blending them with modern technologies and innovative techniques. This integration preserves cultural heritage and catalyzes its evolution into contemporary expressions, bridging the past and the future.

Convergence of Textile, Art, and Technology:

Fabricademy serves as a dynamic nexus where textile



↑ Meeting of Design Students (MDS) in Gyumri 2023, 150 students from all corners of the world were introduced to digital Fabrication by Anoush Arshakyan from Fab Lab Armenia.

artistry, artistic expression, and cutting-edge technology converge through E-textiles, Soft Robotics, Circular Fashion, and Bio-fabrication. This unique intersection sparks creativity, fosters interdisciplinary collaborations, and propels the creation of groundbreaking projects that resonate globally. By integrating artistry with technological advancements, Fabricademy cultivates a vibrant ecosystem that nurtures artistic innovation alongside technological prowess.

Innovative Learning Paradigm:

Fabricademy introduces a paradigm shift in educational

methodologies through project-based learning. This approach immerses participants in hands-on projects that encourage experimentation, critical thinking, and problem-solving skills. By emphasizing practical applications and real-world challenges, Fabricademy equips learners with the expertise and adaptability needed to thrive in today's dynamic creative and technological landscape.

Material Innovation and Sustainability:

Fabricademy is not just about utilizing existing materials; it's about pushing the boundaries of material science and innovation. The program encourages participants to explore, experiment, and create new materials that are not only cutting-edge but also environmentally sustainable. This emphasis on material innovation aligns with global trends towards sustainable design and manufacturing, making it invaluable for Armenia's efforts in environmental conservation and responsible production.

Diverse Applications and Impact:

The Fabricademy program's impact extends far beyond the realm of fashion. Participants are empowered to explore myriad applications across diverse fields, such as medicine, space engineering, and robotics. This multidisciplinary approach unleashes creative potential and fosters innovation, leading to transformative advancements in various industries. From wearable technology in healthcare to space-grade materials and robotic fabrications, Fabricademy cultivates a culture of limitless possibilities and tangible contributions to society.

Advancing Digital Fabrication Excellence:

The Fabricademy program curriculum aligns with the visionary framework outlined by Neil Gershenfield (MIT professor, the director of the Center for Bits and Atoms). Gershenfield's framework identifies three transformative steps in digital fabrication: computer-controlled machines, machines that make machines, and coding and programming materials directly. Fabricademy represents the revolutionary step 3 in this evolution, where coding and programming directly impact materials. This innovative approach is the future of digital fabrication, and Fabricademy presents Armenia with a unique opportunity to embrace and lead this new path.

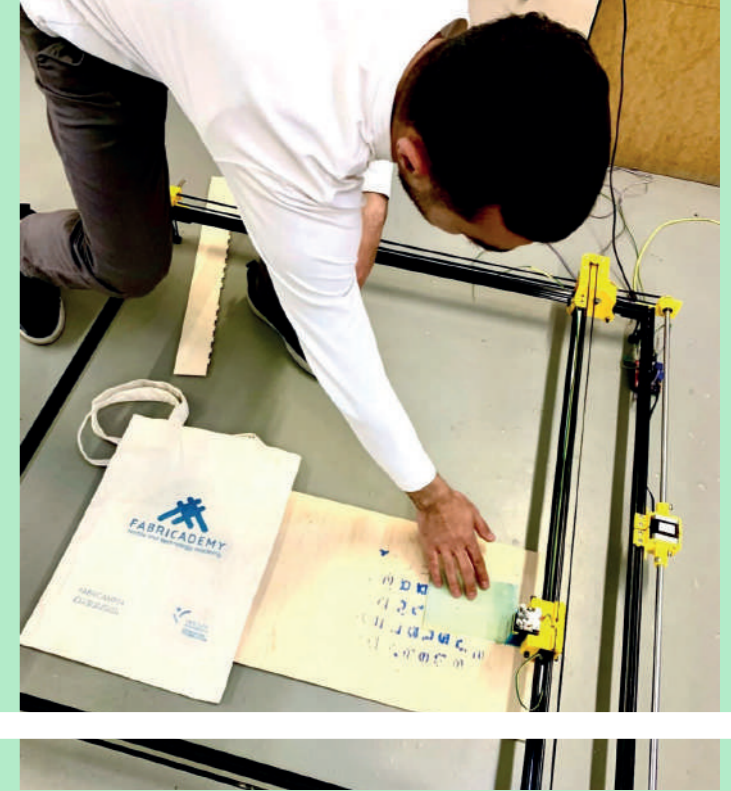
The Fabricademy program in Armenia symbolizes a transformative journey towards preserving heritage, fostering innovation, nurturing talent, and propelling the nation into a future where creativity, technology, sustainability, and cultural heritage converge harmoniously for sustainable growth and global impact.

Anush Arshakyan, Fab Academies Support Instructor and Creative Content Developer at Fab Lab Armenia, introduced Digital Fabrication to 150 design students and young professionals who came from all corners of the world. They were part of a yearly event called the "Meeting of Design Students" (MED) organized by Katapult at the Gyumri Technology Center.

THE STATE ACADEMY OF FINE ARTS IN GYUMRI EXPLORES THE INTERSECTION OF THE DIGITAL AND PHYSICAL WORLDS THROUGH DIGITAL FABRICATION



↑ A cast iron manhole cover, designed, molded, and cast by Fab Lab Armenia.



↑ A Cyanotype Machine designed by Fab Lab Armenia Dilijan for Fab Lab Armenia Gyumri at the State Academy of Fine Arts in Gyumri.

The Institute of Fine Arts, Gyumri Armenia developing a new culture of Digital Fabrication for the Arts.

Fab Lab Armenia invited Gyumri Artists and Artisans to take part in the special Summer Master Class and workshop.

The Partnership between Fab Lab Armenia and Living Lab, Paris-France, fosters Learning by Designing and Designing by Learning. A self-reflecting loop that fosters active learning, new sets of skills, and mastery

Fab Lab Armenia's "Learning by Designing and Designing by Learning" approach emphasizes an active, iterative learning process. This self-reflective loop encourages learners and practitioners to engage in hands-on design projects, developing practical skills and deepening their understanding through reflection. By constantly creating, testing, and refining their designs, individuals become active participants in their own education and professional growth. This approach, emphasized in the "Learning Units" – also known as "Learning Microworlds" at Fab Lab Armenia – fosters innovation, creativity, and problem-solving abilities. It aligns well with constructionist principles, promoting learning through doing and reflection.

Fab Lab Armenia provides an environment for tackling real-world problems. It requires developing productive working definitions for complex, ill-defined issues, crafting and testing provisional solutions, and staying adaptable to avoid being limited by preconceived notions. Design environments,

such as Fab Lab Armenia with its Fab Academy and Living Art / Responsive Environments programs, help organize experiences by connecting techniques and contexts in the designer-learner's mind. Such environments seamlessly connect the virtual with the physical and are meant to stretch the learner's mind, exposing them to diverse scenarios and techniques, helping build real-world skills—not just the ability to execute pre-planned actions but to adapt through "skill in situated action."

Learning by Designing and Designing by Learning form a core strategy for integrating learning with action, following the principles of constructionist learning. Fab Lab Armenia and its network of Fab Labs, connected through the Boston Fab Foundation, foster learning units, also called microworlds, rich in open-ended possibilities. These microworlds give learners the space to design, experiment, and refine, enabling them to build a repertoire of knowledge and skills needed to navigate complex, real-world challenges.

Microworlds are crucial across many sectors, from strategic planning and organizational transformation to reskilling the workforce.

They offer an active learning process, where learners move from ideas to quick prototypes, engaging their intelligence to construct, debug, and improve their understanding. This is in contrast to traditional pedagogy, which often imposes static knowledge through passive learning with external motivations. This approach allows people and practitioners in Digital


refining solutions as they go. In this context, the old educational focus on "getting the right answer" falls short in addressing the complexity and unpredictability of real-world issues. Instead, people arrive at effective solutions through iterative design and experimentation.

As people gain more experience in learning and experimenting through microworlds, they recognize how initial problem definitions can limit solution possibilities. They develop the crucial skill of perspective-taking, which broadens their ability to consider alternative approaches.

Experimenting within virtual worlds teaches people that improvement often requires deconstructing and reconfiguring problem components rather than simply adding to existing solutions. This learning approach highlights the unity of knowing and doing. Real knowledge only proves its value when it can be applied in real-world contexts to produce tangible results. Unlike traditional pedagogy, which separates learning from life, this new learning theory integrates both.

Fab Lab Armenia emphasizes constant dialogue with reality, placing it at the heart of its programs. Through the use of microworlds, Learning by Designing and Designing by Learning create a dynamic relationship between learning and the complexity of working life, leading to a more holistic and practical form of growing knowledge, skills, and mastery.

Fabrication to discover the concept of "powerful ideas," which are those concepts or tools that enable people to understand complex systems and think critically about the world. They are generative of further ideas and can be applied across different situations. Fab Labs and their educational programs embody these powerful ideas, giving learners the chance to arrive at them naturally through hands-on experimentation and exploration. Learning by Designing and Designing by Learning promotes deep thinking about cause and effect, exploring causal links, intended outcomes, and hidden influences. Learners and practitioners use debugging as a strategy for problem-solving, steadily



LIVING LAB, PARIS-FRANCE- AMBIENT INTELLIGENCE IS INVITING ARTISTS AND DIGITAL ARTISANS TO IMAGINE A NEW WORLD!

↑
Living necklace designed by
Ashod and Mamikon Mikaelyan
mentored and coached by
Florent Aziosmanoff Founder
of Living Lab, France.

Fusing Art, Technology, and Imagination: Fab Lab Armenia's Living Art Residency

"A Walk Through the Wonderland of Living Art" Master Class and Hands-on Workshops in Ambient Intelligence and Digital Fabrication By Florent Aziosmanoff, Futurist and Pioneer Of Living Art Industry.

Starting in the summer and running through the fall of 2023 at Fab Lab Armenia in Dilijan, ten artists selected by AGBU's Katapult Creative Accelerator Program came together with digital fabrication specialists to fuse art and technology.

Under the masterful guidance of Florent Aziosmanoff, Paris-based AI and digital art expert, this two-week full-time residency, followed up by personal time and coaching at Fab Lab Armenia, to further the summer workshops, artists and artisans have been exploring how to integrate technology in meaningful ways into the art objects to create Ambient Intelligence.

Learning topics included:

- Object Fabrication
- Electronic Design
- Programming

Artists and Artisans are asked to integrate their newly acquired knowledge into their own daily practice. The resulting projects are the participants' vision of an environment where technology and artistic expression are seamlessly integrated into our surroundings and daily lives.

Aziosmanoff's unique approach and methodology is called Living Art, a term he coined in 2001 as director of the Le Cube's Living Art Lab, and on which he has published extensively through articles and via his books "Living Art: Digital Art" (2010) and "Living Art Foundations (2015).

Through this production approach, original pieces by individual artists are brought to life, showcasing autonomous behaviors, and engaging their environment.

At the Fab Lab Living Art Residency, the resulting projects not only operate independently but communicate and work together, forming a captivating and immersive "wonderland" that weaves ordinary objects into an interactive space.

This orchestrated environment becomes more attuned to human presence and needs. Artists offer a glimpse into our near future—where surroundings offer services and artistic companionship, blending essential functionality with creative expression.

Living Art is The Bauhaus of the Digital Era

Just as the Bauhaus movement emerged during the Industrial Revolution to humanize and elevate mass-produced artifacts, Living Art rises in our Digital Age, merging technology, AI and the arts in ways that profoundly benefit humanity.

The Bauhaus vision united art and engineering to transform everyday objects, making them functional, beautiful, and accessible. Similarly, Living Art combines the creative insight of Artists with the technical prowess of Computer Scientists. Often linked to concepts like IoT, Ambient Intelligence, and Intelligence Augmentation, Living Art represents one of the most dynamic and fast-growing sectors.

Living Art is about designing products and services that serve humans. In collaboration with Fab Lab Armenia, Living Art incorporates digital design and manufacturing, fostering a democratization of creativity—from idea to design to production. Much like Bauhaus artists, who directly created the objects they envisioned, today's designers and innovators craft tailored solutions that shape our digital and physical worlds.

The impact of Living Art extends beyond mere objects—it drives the development of smart cities, where buildings and urban furniture become interactive and adaptive entities that enhance urban living. Even rural areas benefit, as Living Art bridges the divide, allowing people to live wherever they choose while staying connected to the broader and global community.

The Living Art movement fuels the transition from mass manufacturing to personal production. It reshapes industries and economies.

Flower by Gayane Unanyan

A decorative corset worn over clothing, which can act as a protective shield.

Bright Artsakh by Meri Martirosyan

A garment that celebrates the resilience of Artsakh. A "Tatik-Papik" image comes to life on a garment with life and sounds around. It makes us realize that silence is dangerous because it can make us disappear.

PAR by Efi Farmaki

The "PAR" mobile suspension, composed of three Armenian letters forming the word "ՊԱՐ" which means "dance," is an installation that invites people in the vicinity to join a circle dance.

Embroidery by Hreghen Gasparyan

A lace doily with a delicate personality, which blossoms in subtle luminescence when in a peaceful atmosphere and contracts nervously when the surrounding ambience becomes noisy.

Serenity by Elina Galoyan

A "living" lamp whose pattern and intensity depend on the quality of behavior of nearby people. The light source passes through a layer of bacteria that thrive in a peaceful atmosphere or die when the noise increases.

Sunflower by Ashot Mikayelyan

A large sunflower offers its leaves to the visitor's caress. If the contact is too short, the flower dies. But if the contact is long enough, the flower begins to live intensely, straightening its corolla and developing its luminous animation, symbolizing the attention that life on Earth needs today.

Night by Eliza Nersisyan

An interior lamp becomes a small piece of nature where animals live in the forest, in a play of light and shadow. A harmonious landscape in a calm atmosphere, if the atmosphere becomes noisy and the environment declines, its animals escape. Try to clap and see !

Living Mona Lisa by Florent Aziosmanoff

An adaptation of Leonardo da Vinci's masterpiece in the form of a painting in which Mona Lisa lives in a relationship with her viewers.

Inception by Mamikon Mikayelyan

A sculpture opens into a small universe, symbolizing the crucible of life. Visitors grasp a small sphere in the palm of their hands, representing an ovum, which then begins to vibrate. By placing it in the center of the sculpture, a whole environment of small luminous shapes representing spermatozoa lights up, representing the birth of life.

Light up ! by Eliza Baghdiyan

"Home is where your heart is", A climb in the mountains of Artsakh, on the summit of which a transparent house shelters a human and a heart, giving and receiving love. A caring touch of its landscape by visitors illuminates a responding world and spreads love in the universe.

A Wonderland by Anna Badalyan

The art of crafting an immersive installation. Creating a balance between individual and collective artistic visions and their practical execution to offer the visitor a sense of wonder and a deeper understanding of the emerging future.

The challenge was to imagine that smartphones' functions were no longer confined to handheld devices but seamlessly integrated into our urban furniture, buildings, and living rooms. Everyday objects become smart, interactive, and personalized. People access information, communicate, and navigate without needing a physical device. The city becomes an extension of our digital selves, offering invisible, ubiquitous interfaces through gestures, voice, or augmented reality. This creates a more fluid, connected experience where the technology is embedded in the world around us, adapting to our needs as we move through it.



A Living Sunflower engaging with visitors, by Ashot Mikayelyan

FROM LIVING LAB: LIVING ART RESIDENCY OVERVIEW OF CONCEPTS AND PROJECTS FOR 2023



CONTINUOUS CONTENT DEVELOPMENT AND KNOWLEDGE SHARING

ANNUAL REPORT 2023



LAB ARMENIA EDUCATION FOUNDATION

Anoush Arshakyan, Creative Content Developer and Lead for Fabricademy Programs, collaborates with Maxime Richard, Pedagogical Content Developer and Lead for Labster and Fab Learning Academy, to continuously design and develop innovative activities, programs, and academic training. Together, they create opportunities for learners of all back-grounds, from beginners to professionals, who are eager to explore the exciting frontiers of Digital Fabrication.

Cultivating a Global Network of Fab Lab Instructors: Fab Academy Annual Bootcamp with MIT Professor Neil Gershenfeld

Each year, Regional Instructors collaborate with MIT Professor Neil Gershenfeld to share the best learning and teaching practices, exchange experiences, and tackle self-assigned challenges to drive further innovation.

PROGRAM – Bootcamp assignments

- Lectures by Professor Gershenfeld
- Participate on discussions of Assessment Guide and evaluation
- Hands-on sessions with Global Fab Academy Team on advanced assignments
- FreeCAD: V0.21 improvements, tricks and tips
- KiCAD: v6 improvements, tricks and tips
- svGPCB: WOW!
- samd: make, stuff, program, workflows with the new programmers
- Continue Urumbu by making modular machine parts
- Building a Voron 2.4 - CoreXY - Klipper controlled - DIY kit
- Talks and tutorials from experts in the network
- Fab Academy Instructors Bootcamp Certificate of Survival

What you always wanted to know anyway:

- Local evaluation (when is it 100%?) and can be sent to Global Evaluation
- Global role and responsibility (communication with locals and students)
- How to document group assignments
- Documentation and design files (source and/or interchange files?)
- How to deal with students

Special assignment:

- Make something you cannot do in a super Fab Lab with machines that are at least 15 years old
- Babken Chugaszyan took on the challenge of printing a 1m long axis using SainSmart INFI-20 Belt 3D Printer that was hanging on the wall.

<http://academany.fabcloud.io/fabacademy/2023/instructorsbootcamp/Projects/PrintableAxis/>

Bootcamp participants were also invited to the Amsterdam University Applied Science (AUAS) Makerspace opening.

Babken Chugaszyan describes the space as vast and equipped with modern digital machinery. The panel talk, Neil's presentation, and the ceremony were mind-opening

experiences.

"I had never experienced such harmony and tolerance among people as I did there. All the professors, maker community members, and Fab Lab participants were fully supportive of each other and completely engaged. I witnessed exceptional collaboration and strength linking all the organizations present. People were united by strong bonds of trust, a deep sense of purpose, and a passion for their work, which made them incredibly powerful. This was evident in their presentations, their questions to one another, and their open discussions. It was the first time I had seen a genuinely open discussion and a panel talk so engaging with the audience."

A Telling Fact:

Amsterdam is already showing the future of design and construction.

The picture below shows Babken Chugaszyan in front of a 3D-printed stainless steel bridge.
<https://www.dezeen.com/2021/07/19/mx3d-3d-printed-bridge-stainless-steel-amsterdam/>
The Alan Turing Institute and Arup fitted the bridge with a network of sensors that allows the bridge to collect data and build a digital twin to keep track of its performance and health.

Regional Instructors participate in the annual Bootcamp at a Super Fab Lab to gain advanced skills that enhance their local initiatives, elevate collaboration through an expert network, and innovate alongside their mentor, MIT Professor Neil Gershenfeld.

The immersive environment of a Super Fab Lab enables participants to grasp the dynamics of scaling operations and production from the local to the global level.

A key highlight of the Bootcamp is the transformative power of Super Fab Labs, which possess the capability to produce machines that can fabricate machines. This access to advanced fabrication technologies empowers participants to tackle complex and ambitious projects, scaling pilot initiatives into large-scale implementations that can benefit entire regions. A Super Fab Lab can build an ecosystem that integrates the mini fab labs it can produce, skilling people of all ages and boosting local manufacturing.

Fab Lab Armenia aims to acquire a Super Fab Lab and catalyze economic growth, competitiveness, and resilience across the country and its region.



↑ Babken Chugaszyan is standing in front of a 3D-printed stainless-steel bridge Created by Joris Laarman and built by Dutch robotics.

BLOGS: FABLABARMENIA.COM



A CONVERSATION WITH RUSLAN GINDULLIN. A STUDENT AT UWC AND A VOLUNTEER AT FAB LAB ARMENIA.

FAB ACADEMIES

BLOG

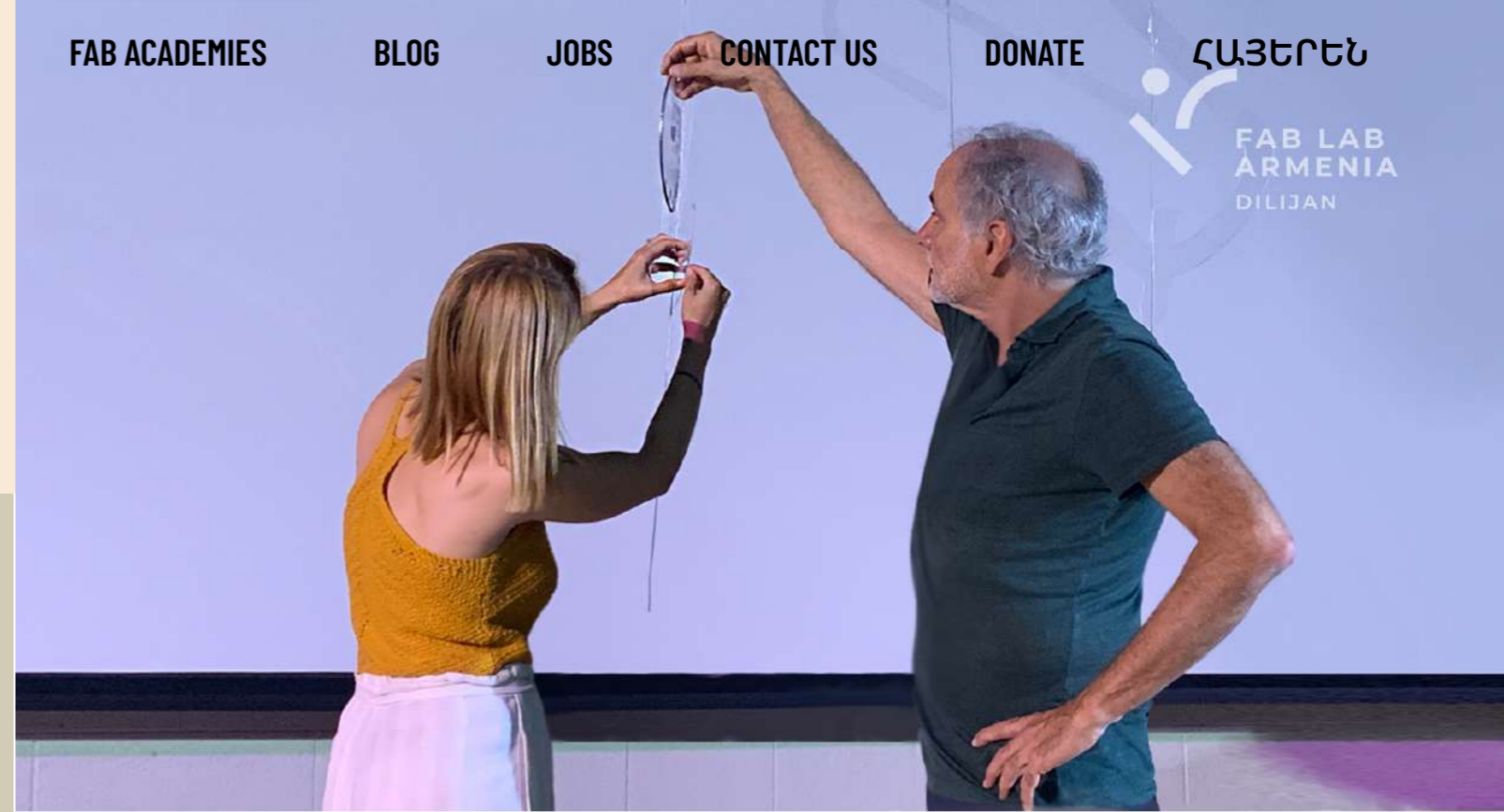
JOBS

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ARMENIA
DILIJAN



Funded by the European Union



CreativeArmenia



FAB LAB
ARMENIA
DILIJAN



Katapult
CREATIVE ACCELERATOR PROGRAM

Welcome to the Fab Lab Armenia Blog

The Fab Lab Armenia Blog is your gateway to the stories, innovations, and collaborations shaping our community and beyond. Covering a wide range of topics, the blog dives into Fab Lab Armenia's key activities, from cutting-edge digital fabrication techniques to creative projects solving local challenges. It also highlights personal stories from individuals exploring the possibilities of digital manufacturing, offering unique insights into their experiences and achievements. Discover a world of creativity, collaboration, and inspiration by exploring extracts and full articles on our website:

Fab Lab Armenia Blog

(<https://fablabarmenia.com/blog/?swcfpc=1>).

↑ Unleashing the Soulful Melodies of the Native American Flute at Fab Lab Armenia's Captivating Workshop

Fab Lab Armenia's Native American Flute Workshop in Dilijan brought together a diverse community to craft their own unique instruments and discover the enchanting world of this ancient musical tradition. Led by renowned experts Clint Goss and Vera Shanov, the event embodied the organization's values of creativity, collaboration, and cultural exchange.

Through hands-on guidance and spellbinding performances, participants from all backgrounds transformed raw materials into soulful tools of expression, filling the room with a symphony of melodies that transcended language and borders.

The workshop's blend of traditional artistry and modern technology showcased Fab Lab Armenia's commitment to nurturing artistic expression and fostering a sense of community, inspiring all who attended with the transformative power of music-making.

<https://fablabarmenia.com/events/native-american-flute-workshop/?swcfpc=1>

↑ "Fabricademy Bootcamp Armenia: Weaving Tradition, Innovation, and Community"

Fab Lab Armenia's collaboration with Fabricademy brought together a diverse global community for an immersive week of creativity and discovery in Armenia. Participants explored the intersection of textiles, digital fabrication, and sustainability through hands-on workshops, cultural excursions, and collaborative projects.

From natural dye workshops to e-textile experiments, the Bootcamp blended Armenia's rich heritage with cutting-edge technologies, igniting inspiration and forging new connections across borders.

Dilijan's Fab Lab and Gyumri's artistic legacy provided a vibrant backdrop for participants to rethink the role of machines, challenge conventional practices, and envision a future where tradition and innovation coexist harmoniously.

The Bootcamp's culminating exhibition showcased innovative designs, from biomaterial fashion to programmable fabrics, cementing Fab Lab Armenia's position as a hub for transformative textile education.

As the Fabricademy program expands to Dilijan, this impactful collaboration promises to continue fostering a global community of makers, artists, and entrepreneurs, united in their pursuit of a more sustainable and creative future.

<https://fablabarmenia.com/events/fabricademy-bootcamp-armenia-2024/?swcfpc=1>





UNVEILING CREATIVITY: CRAFT YOUR OWN CRAZY MASKS

↑ Participants craft masks using ancient techniques paired with modern digital tools, blending heritage and sustainability.

Building the Future through Creativity and Technology

Both programs at Fab Lab Armenia share a common goal: empowering participants to merge creativity with technology in ways that transform the way they see and interact with the world. Whether exploring the fusion of tradition and innovation or learning to program physical environments, these initiatives equip individuals with skills that are not only practical but also inspiring. By fostering a spirit of exploration and innovation, Fab Lab Armenia ensures that participants are not just consumers of technology but active creators and contributors to a more inventive and sustainable future.

→ Exploring Arduino, participants bring interactive game-like experiences to life by programming real-world sensors and devices.

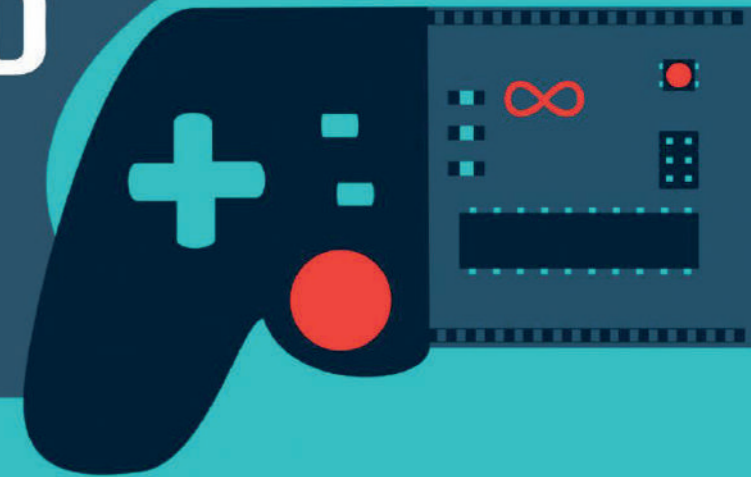


FAB LAB
ARMENIA
DILIJAN

ING

CAL

D



rogram your game to
the physical world
duino, an open-source
ronics platform

PLY NOW!

inning: October 27

on at Fab Lab Armenia Dilijan

FAB LEARNING ACADEMY



Fab Learning Academy: Empowering Educators through Constructionist Digital Fabrication

Fab Learning Academy is learning and teaching through the use of a Fab Lab and the process of digital fabrication. It is based on the concepts of constructionist learning developed by Professor Papert, who is one of the Founding Fathers of Artificial Intelligence and a pioneer in bringing computer science into education.

Fab Learning Academy is a distributed learning and teaching program that certifies educators globally. This concerns educators who teach using digital fabrication tools and technologies and are contributing and sharing best practices through the network of Fab Labs and Fab Academies.

The pilot project was designed in collaboration with the Fab Foundation based in Boston and 7 countries, each contributing 3 educators. It ran from April to June of 2023 and is a preparation for the full 8-month program that will be launched in January 2024.

The goal of this pilot is to design a program and tools that are specifically shaped to train teachers and support them in developing curriculum and lesson plans needed for the 21st century.

Armenia selected three educators from the field of Humanities and the Arts to demonstrate that teaching through applied learning using digital fabrication tools can apply to all STEAM education disciplines. Lusine MLKE-Galstyan - Ani Bejanyan and Anahit Apinyan

↑ Ani Bejanyan, Elementary School Teacher at the Central School of Dilijan created a rainbow puzzle to teach about colors.

↑ Anahit Apinyan, Vice Principal of the Central School of Dilijan created an English language grammar wheel for her middle school students.

Examples of material to teach with developed by teachers from Armenia.

Lilya and Syuzanna Demonstrating Interactive Cell Organoids and Structural Characteristics.

The model aims to present cell organoids in a large size, allowing for a better understanding of their structure and function. The goal is to study the cell structure and create an interactive model using digital fabrication technologies.

Ani created a monochrome rainbow puzzle that not only captivates the kid's imaginations but also serves as an interactive platform for honing their English skills.

The kids actively participated in coloring the puzzle and utilized their language abilities to describe the colors and engage in discussions during the class.

Anahit Apinyan and her Grammar Wheel, Playing to Learn / Learning to Play.

She designed and created this Grammar Wheel to help her students understand the structure of the English language while playing. Anahit brought her vision to life, showcasing the power of hands-on learning and innovation.

Armenia wins one of three "Best Learning Lessons Awards," chosen from thousands of teachers across 2,800 labs in 125 countries.

UNITE. LEARN. EMPOWER.

ANNUAL CONFERENCE: NEXT IS NOW!

NEXT IS NOW! UNITE. LEARN. EMPOWER

A Strategic Partnership to Bring Best Learning and Teaching to all Schools.

The conference features a two-part simultaneous event:

- Keynote Addresses and Panel Presentations
The advances in Formal Education are through projects and strategic partnerships between: The Ministry of Education, Science, Culture and Sports of the Republic of Armenia, Fab Lab Armenia Education Foundation – Labster – Fab Foundation/MIT Center for Bits and Atoms.
- The Advances in Non-Formal Education and Independent Research are through projects and strategic partnerships with: Futurists, Artists, and Artisans who work through Katapult/AGBU/Creative Armenia/European Union – Living Lab, Paris France.
- Educational Products Faire
Highlighting the already existing Ecosystem of Non-formal Education and Independent Research Leaders in Armenia with: OWS Think Tank – Armath – COAF – Aren Mehrabyan Foundation – REAL School.

Fab Lab Armenia Education Foundation Sponsors

- The Central Bank of the Republic of Armenia
- Evocabank

Partnerships for Collaborative projects

- Fab Lab Armenia Education Foundation
- The Ministry of Education, Science, Culture, and Sports of the Republic of Armenia
- LABSTER Virtual Science Labs
- Katapult/AGBU / Creative Armenia / European Union
- Fab Foundation and Fab Academies Programs Boston/MIT Center for BITS and ATOMS
- Living Lab- Paris,France

Press Release

Fab Lab Armenia Education Foundation, Strategic Partnerships and Stakeholders Unite for Advancing STEAM Education Innovation for High Schools.

Introduction

An Overnight and Worldwide Transformation in Education Systems, Learning and Teaching Methodologies, and Technologies.

The global shift to digital living began with the COVID-19 pandemic in 2020. It rapidly transformed how we approach education, healthcare, business, and entertainment. Three years later, our world has fundamentally changed. Everything that can go digital—services, goods, and our daily interactions—are going digital at an ever-accelerated pace.

Fab Labs, like computers decades ago, are now essential. What matters most is the interconnected network of knowledge and people, much like how we now prioritize the internet over individual computers.

NEXT IS NOW!

Fab Labs as technology hubs that support Hybrid Education and STEAM learning and doing.

Fab Labs are emerging as key tech hubs, reshaping education for all ages and fostering hybrid learning environments. The goal is seamless navigation between physical and digital realms, ensuring ongoing educational excellence.

The Initial focus is:

- High Schools, with the participation of a few Universities
- Upgrading Educational Curriculum
- New Learning and Teaching Methodologies
- New policies
- Re-skilling educators in STEAM education and Digital Fabrication
- Identifying and adopting the latest digital technologies
- Developing strategic partnerships to build an ecosystem of excellence in education locally and globally.
The Innovation Journey Starts with High Schools
The two major reasons are:
- Secure a higher number of students on the path to higher education,
- Prepare for the new skills required for the Digital Economy.



NEXT IS NOW! Conference

The “Next is Now” conference brings together government, public, and private education stakeholders to envision transformative educational models focusing on high school education and extending its impact through higher education partnerships. This initiative is about making high school the foundational point for skills and knowledge aligned with future demands, ensuring students have the competencies required in an increasingly digital world.

Partnerships between all stakeholders

The proposal is to build a model partnership that incorporates universities, high schools, fab labs, and private avant-garde model schools and to exchange best thinking and best practices. The goal is to provide high schoolers with access to applied learning, develop a taste for research, and enroll in higher education.

Upgrading Educational Curriculum

The educational curriculum must be updated to be more dynamic and relevant to current societal and technological needs. Interdisciplinary education and applied project-based learning that is designed to address real-world challenges can open

personalized learning paths that cater to students’ diverse interests and career aspirations.

The Next Learning and Teaching Methodologies

A key element of the “Next is Now” conference involves exploring innovative learning and teaching methodologies that exist “Now” in Armenia and the connected education ecosystems.

New Policies for Education

Policy reform is crucial for implementing these shifts successfully. New policies need to support curriculum flexibility, enabling high schools to incorporate advanced technologies and partnerships with universities and non-formal education establishments.

Re-skilling Educators in STEAM Education and Digital Fabrication

Educators are eager to be equipped with new knowledge and competencies to be able to empower students with the skills needed for the digital economy. This includes training in STEAM subjects using digital fabrication and the use of emerging educational technologies. Re-skilling programs

↑ The conference fair brought together formal and informal educational institutions, forming the ecosystem of innovators in Armenia.

aim to train educators to be facilitators who can guide students through technology-rich learning experiences.

Adopting the Latest Digital Technologies

We all recognize the importance of staying current with technology’s rapid evolution. By incorporating emerging technologies like artificial intelligence, virtual reality, and 3D printing, schools can offer cutting-edge, relevant learning experiences.

Strategic Partnerships for a Global Ecosystem of Excellence

Building a robust ecosystem requires forming strategic partnerships with technology companies, research institutions, and education providers locally and globally. Fab Lab Armenia is proposing the Fab Learn Academy program, designed in collaboration with MIT Professor Niel Gershenfeld. A Distributed Learning and Teaching system that creates an ecosystem of excellence through continuous innovation and knowledge-sharing to equip students to thrive in the digital economy. We all must come together to co-create a bold, cohesive approach to modernizing education that aligns with our century’s technological, social, and economic realities.

ANNUAL CONFERENCE: NEXT IS NOW! UNITE.LEARN.EMPOWER.



ՀՀ Կենտրոնական Բանկի
Ուսումնահետազոտական Կենտրոն
Դիլիջան

Ուրբաթ,
Նոյեմբերի 17,
2023
12:00 – 17:00

ՀԱԶՈՐԴԸ ՀԻՍԱ ՀԱՍԱԽՄԲՎԵԼ, ՈՒՍԱՆԵԼ, ՀԳՈՐԱՆԱԼ

ԼԱԲՍԹԵՐ առցանց գիտական լաբորատորիաները և Ֆաբ Ուսուցման Ակադեմիան այժմ հասանելի են դպրոցներին:

- 12:00 **Գրանցում**
Յուրախություն
- 13:00 **Ողջույնի խոսք. ՀԱԶՈՐԴԸ ՀԻՍԱ**
Ժաքելին Կարաասլանյան, Համաժողովի մոդերատոր,
Learning Learning Architects ՊՏ և համահիմնադիր,
«Ֆաբ Լաբ Հայաստան» հիմնադրամի խորհրդի անդամ
- 13:10 **ԱՎԱՆԴԱՎԱՆՆԻՑ ԴԵՊԻ ՍՏԱՆԱԿԱՎԻՑ ԿՐԹՈՒԹՅՈՒՆ**
Ժաննա Անդրեասյան,
ՀՀ ԿԳՄՍ նախարար
- 13:20 **ՀԻՄՆԱԿԱՆ ԵԼՈՒՑՅՑ**
ԳԻՏՈՒԹՅԱՆ ԱՌՏՄԱՆ ՈՒՍՈՒՑՈՒՄ - ԿԱՊԱԿՏՎԱԾ ԻՐԱԿԱՆՈՒԹՅՈՒՆՆԵՐ
ԼԱԲՍԹԵՐ
Մալթա Սթեֆիս
Լաբսթեր և UbiSim համագործակցությունների տնօրեն Եվրոպայի համար Միջին Արևելքում և Աֆրիկայում
- 13:45 **ՖԱԲ ԱՎԱՐԵՍԻԱՆԵՐ, ԳԻՏՈՒԹՅՈՒՆ ԹՎԱՑԻՆ ԱՐՏԱԴՐՈՒԹՅԱՆ ՄԱՍԻՆ**
Բաբկեն Չուգասյան
Ֆաբ Լաբ Հայաստան Կրթության Հիմնադրամի ՊՏ
Ֆաբ Ակադեմիա 2023-ի շրջանավարտների և Ֆաբ Լաբ Հայաստանի հիմնական
անդամների աշխատանքների ներկայացում
Անուշ Արշակյան
Մաքսիմ Ռիչարդ
Ռուդոլֆ Իգիտյան
Անահիտ Ապինյան
Անի Բեյանյան
Լուսինե Մլեք-Գալստյան
- 14:30 **Սուրճի ընդմիջում**
Նախագծերի ցուցադրություն նախաարահում
- 15:10 **ՊԱՆԵԼԱՑԻՆ ԶՆՆԱՐԿՈՒՄ: Էկոհամակարգ, որը համայնքում - Ուսուցանում - Հզորացնում է**
Հայաստանում կրթության նոր ձևերին աջակցող ուսումնական համայնքների մոդելներ
Մոդերատոր Ժաքելին Կարաասլանյան
- 15:15 **Սերմանելով ստեղծարար տնտեսություն**
Կատապուլտ աքսելերատոր / ՀԲԸՄ
Լին Պարավյան, Ռազմավարության ստեղծող,
OWS Think Tank հիմնադիր
ՖԼՀԿՀ խորհրդի անդամ
- 15:20 **Արմաթ ինժեներիա. Հետդպրոցական ծրագրեր ՊՏԾԱՄ**
Կրթության համար
Արմաթ
Մարգին Կարապետյան, Գործադիր տնօրեն
- 15:25 **Համայնքը որպես ուսումնական ծրագիր**
ՔՈՍՏ
Շահանե Հալաջյան, Կրթական ծրագրերի կառավարիչ
- 15:30 **Լինելով թվային**
Էվիկա Խաչատրյան, Կարգության նախագահի տեղակալ
Տաթևիկ Խաչատրյան, Կարգության նախագահի տեղակալ
- 15:35 **Ֆինանսական գրագիտություն նոր տնտեսության համար**
ԿԲ
Արմեն Նուրբեկյան, ՀՀ ԿԲ փոխնախագահ
- 15:40 **Դպրոցը՝ նոր ձևաչափով**
Իրական դպրոց
Վահագն Պողոսյան, Հիմնադիր
- 15:45 **Տիեզերաշինության ուսումնական ծրագիր ավագ դպրոցների համար**
Արեն Մեհրաբյան հիմնադրամ
Միհր և Սաթևիկ Մեհրաբյաններ, Հիմնադիրներ
- 15:50 **Հարց ու Պատասխան**
- 16:10 **Եզրափակիչ խոսք**
Ժաքելին Կարաասլանյան



Central Bank of Armenia
Training and Research Center
Dilijan

Friday,
November 17,
2023
12:00-17:00

NEXT IS NOW! UNITE.LEARN.EMPOWER.

Online LABSTER Science Labs and Fab Learning Academy now available for Schools in Armenia.

- 12:00 noon **Registration**
Reception buffet
- 13:00 **Welcome, Next is Now!**
Jacqueline Karaaslanian, Moderator for the Conference
CEO and Co-Founder of Learning Learning Architects LLC
Board Member of Fab Lab Armenia Foundation
- 13:10 **FROM TRADITIONAL TO MODERN EDUCATION**
Zhanna Andreevyan, Minister of Education, Science,
Culture and Sports of The Republic of Armenia
- 13:20 **KEYNOTE**
ONLINE SCIENCE EDUCATION – CONNECTED REALITIES
LABSTER
Malte Staps
Director of Partnerships Labster & UbiSim for Europe, the Middle East and Africa
- 13:45 **INTRODUCING FAB ACADEMIES,
THE SCIENCE OF DIGITAL MANUFACTURING**
Babken Chugaszyan
CEO of Fab Lab Armenia, Education Foundation
Overview of works by Alumni of Fab Academy 2023
and works by Key members of Fab Lab Armenia
Anoush Arshakyan
Maxime Richard
Rudolf Igityan
Anahit Apinyan
Ani Bejanyan
Lusine Melke-Galstyan
- 14:30 **Coffee Break**
Walk Through Projects and Demos in the Exhibit Area
- 15:10 **PANEL: An Ecosystem that Unites – Learns – Empowers!**
Models of Learning Communities Supporting New Forms of Education In Armenia
Moderator: Jacqueline Karaaslanian
- 15:15 **Seeding the Creative Economy**
Katapult Accelerator/AGBU
Lynn Paravyan, Strategy Developer @ Katapult
founder of OWS Think Tank
Board Member of Fab Lab Armenia Education Foundation
- 15:20 **Armath Engineering After-School Programs for
STEAM Education**
Armath
Sargis Karapetyan, CEO
- 15:25 **Community as Curriculum**
COAF
Shahané Halajyan, Education Programs Manager
- 15:30 **Being Digital**
Tatevik Khatchatryan, Deputy Chairman of
the Management Board
- 15:35 **Financial Literacy for a New Economy**
CBA
Armen Nurbekyan, Deputy Chairman
- 15:40 **A New Model for School**
REAL School
Founder : Vahagn Poghosyan
- 15:45 **Space Engineering Curriculum for High Schools**
Aren Mehrabyan Foundation
Mher Mehrabyan and Satik Nairyan, Co-Founders
- 15:50 **Questions and Answers Session**
- 16:10 **Closing Remarks**
Jacqueline Karaaslanian

ANNUAL CONFERENCE: NEXT IS NOW! UNITE.LEARN.EMPOWER.



Members of the Fab Lab Armenia Kids Club are presenting their research and projects to Armen Nurbekyan, Deputy Chairman of CBA and Chairman of the Board for Fab Lab Armenia.

NEXT IS NOW!

Educational Products Faire

Projects Created and Presented by Educators and Students to Inspire Learning, Creative Thinking, and Co-creation! Students from the Fab Lab Armenia Kids Club – Mkhitaryan, Armen Melkonyan, and Aleqs Aghajanian – are presenting their self-directed research, product design, and manufacturing to Armen Nurbekyan, Board Member of the Fab Lab Armenia Education Foundation.

Educational Products Faire to Showcase Innovation in Learning

The Educational Products Faire is a dynamic event where educators and students showcase projects designed to inspire learning, foster creative thinking, and promote collaborative creation. This interactive gathering brings together innovative tools, prototypes, and educational products that aim to transform how we approach teaching and learning across various fields.

Insights gained from the “Next is Now” Faire

Projects Created by Educators and Students:

Attendees had the opportunity to explore concepts, projects, and educational material that their educator colleagues and their students had developed working together through Digital Fabrication. These projects emphasize the power of hands-on learning and demonstrate how co-creation between teachers and students can lead to impactful educational experiences.

Fostering Creative Thinking:

The fair showcases a hub for creativity where educators and students push traditional education’s boundaries. Attendees could witness various approaches to problem-solving and innovation, encouraging the development of essential skills like critical thinking, adaptability, and ingenuity.

Promoting Co-Creation and Collaboration:

Beyond individual creativity, this event emphasizes collaboration, demonstrating how educators and students can collaborate to create products and experiences that enrich learning. These collaborations illustrate the importance of diverse perspectives in creating well-rounded educational tools and solutions.

Technology as an Equalizer

Digital fabrication has introduced a paradigm shift in education by fostering a learning environment where teachers and students are co-learners. The tools and technologies involved are evolving so quickly that they challenge traditional models of expertise, placing both teachers and students in a state of continuous learning. This shared learning journey emphasizes that education is no longer a one-way transfer of knowledge but an interactive, collaborative process.

With digital fabrication, teachers often explore the tools and methodologies alongside their students, leveling the traditional hierarchy. This dynamic demonstrates that expertise can emerge from anyone and that the “teacher” can just as often become the “learner” in a given moment. The rapid advancements and creative possibilities in this field encourage curiosity and experimentation, which fuels a more democratic and open-ended form of education. Fab Lab Armenia creates an environment that is transformative as it models lifelong learning in real-time, self-directed learning, and engagement in doing research

for educators and students.

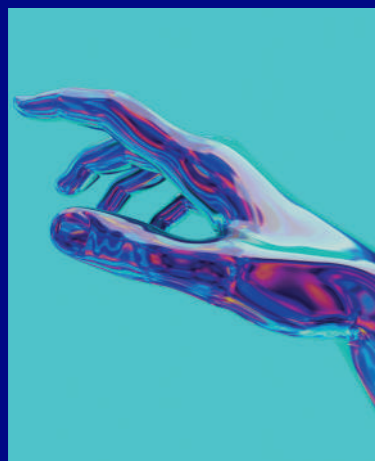
Teachers and students alike engage in ongoing discovery, fostering resilience, adaptability, and innovation as core skills. By demonstrating that learning is continuous and without boundaries of age or role, digital fabrication stands as a powerful example of the shift toward an omnipresent learning culture, happening everywhere, at any time, and driven by the collaborative spirit of making and designing together.

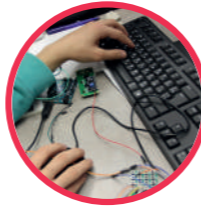
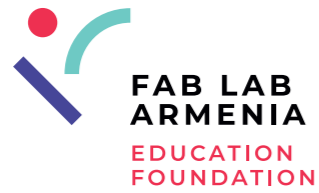
Students asked permission to be trusted to form their own research and development groups.

Middle school Students wanted to choose topics they were genuinely interested in exploring. They set their own learning goals, created challenges, and only sought guidance from teachers once they had fully tapped into their own resources. This self-directed approach sparked an exceptionally high enthusiasm, as students embraced the freedom to pursue what interested them without limitations imposed by what adults imagined they could do. Notably, the challenges they set for themselves were more complex than what teachers might have assigned, revealing their capacity for ambitious, independent learning.

TEACHERS PRESENT THEIR RESEARCH AND DEMO THEIR EDUCATIONAL PRODUCT DEVELOPMENT

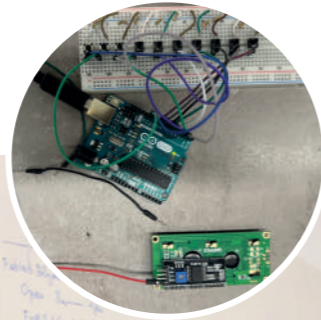
19 WORKS THROUGH DIGITAL FABRICATION AT FAB LAB ARMENIA





MKHITAR HOVHANNISYAN SAFEVAULT

UNLOCKING SECURE STORAGE

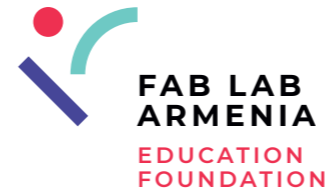


Introducing SafeVault

SafeVault, an exciting ongoing project, is dedicated to revolutionizing secure storage solutions by seamlessly blending user-friendly features with cutting-edge security measures, ensuring a dependable and intuitive experience.

At its core, SafeVault is powered by an Arduino Uno microcontroller. It features a user-friendly 4x4 keypad for effortless input, an informative LCD screen, and a robust solenoid lock to fortify security.

Conceived by the young innovator, Mkhitar Hovhannisyan, alongside his talented friends Armen Melkonyan and Aleqs Aghajanyan, this project was born when they were just 14 years old. SafeVault is a testament to their unwavering pursuit of secure storage solutions and its educational impact, influencing their teacher and leading to the integration of related topics into school curricula.



ELIZA BAGHDIYAN LIGHT UP!

ILLUMINATING LOVE AND CONNECTION



Introducing Light Up!

In the heart of Artsakh's mountains, Eliza Baghdiyana crafts a visual journey. At the summit stands a transparent house, symbolizing the exchange of love with the universe.

Fostering a sense of belonging and emotional connection through art, the project invites everyone to touch the house, giving love and witnessing the transformative power of a small light. The transparent house becomes a sanctuary for reflection and connection. Visitors, by touching it, illuminate a responding world and spread love.

Light Up! draws inspiration from Fab Lab Armenia creativity and embroideries, merging art with technology.





LUSINE MLKE-GALSTYAN RHYTHM BUILDERS FOR KIDS

EMBRACE THE BEAT!



Introducing Rhythm Builders

In a groundbreaking blend of technology and education, Lusine MLKE-Galstyan introduces "Rhythm Builders," a project poised to revolutionize music education for children.

This unique tool, designed to be both fun and educational, empowers kids to not only hear but also physically touch and manipulate rhythm patterns. With a hands-on learning approach, children can unleash their creativity by creating and experimenting with their personalized rhythms through the integration of digital fabrication.

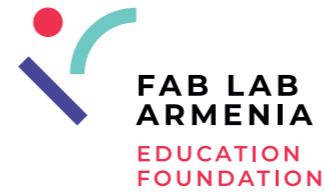
The mission of Rhythm Builders is clear — to make music education more accessible, enjoyable, and effective for kids, fostering a lifelong love for music and rhythm. Tailored for music beginners of any age, it provides a distinct and engaging learning experience.

Inspired by digital fabrication experts and motivated by a commitment to bridge the gap in understanding the importance of rhythm, Lusine MLKE-Galstyan, in collaboration with the Fab Lab Armenia team, brings forth this transformative project.

"Rhythm Builders" is more than just a tool; it's an entry point into a world where technology meets creativity, opening the door to a lifelong journey of musical discovery.



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LILIA ALOYAN EXPLORING CELLULAR BIOLOGY

A TANGIBLE APPROACH

Introducing Exploring cellular biology

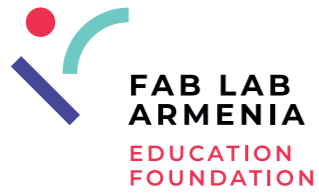
Lilia Aloyan and her students present Making Cellular Biology Tangible: Understanding Cell Structure. This project dives into the microscopic world, dissecting the fundamental unit of life—the cell.

Their creation is an impressive prototype featuring cell organoids made of acrylic, PLA, wood, and QR codes. These organoids offer audio-formatted information, unveiling the significance of cells as life's building blocks, showcasing essential components and structures.

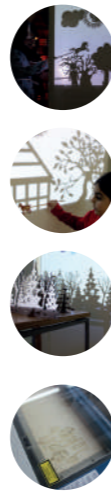
Utilizing modern technology like 3D printers, laser cutters, QR code generators, and audio recorders, the project enhances understanding while equipping students with practical skills. Under Lilia Aloyan's leadership, this collaborative effort seamlessly blends theoretical knowledge, artistic elements, and technical expertise.



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ANOUSH ARSHAKYAN STORY LAB ILLUMINATING IMAGINATION AT FAB LAB ARMENIA



Introducing Story Lab

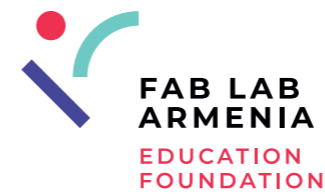
In Fab Lab Armenia, excitement filled the air as eager kids gathered, ready to unleash their creativity. The room transformed into a playground of possibilities, where curious minds explored the enchanting fusion of technology and imagination.

The adventure began with young creators mastering laser cutting, turning doodles into whimsical characters—lions, fairies, and more. Guided by the hum of machines, they collaboratively crafted a shadow theater, where characters came to life in a dazzling spectacle, embodying the essence of their collective imagination.

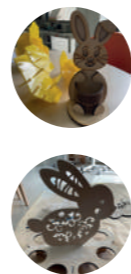
Leaving with both creations and newfound inspiration, the young dreamers departed Fab Lab Armenia, having added another chapter to its story—one painted with their laughter, creativity, and the pure wonder of their magical journey.



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NANOR KASSABIAN CRAFTING JOY, LEARNING, AND INSPIRATION



Introducing Educational Puzzles, Bunny Holders, Ballerina Napkin Holder

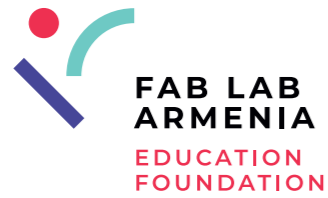
Nanor Kassabian, a dedicated volunteer and parent in Fab Lab Armenia, inspires with her creativity and educational initiatives.

Through projects like Educational Puzzles, she introduces innovative teaching methods, combining technology and creativity.

From the initial Bunny Holders to the refined Ballerina Napkin Holder, Nanor's journey reflects the transformative power of dedication within the Fab Lab Armenia community.

Her projects embody joy, learning, and a commitment to crafting unique and personalized pieces.

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RUDOLF IGITYAN HIMA

TIME, MUSIC, AND INNOVATION



Introducing Hima

Experience time like never before with Hima. This extraordinary clock goes beyond mere timekeeping. When the minute hand completes its rotation, the Armenian national anthem fills the air, turning each moment into a musical masterpiece.

Crafted with precision, Hima boasts an intricate gear system that allows nuanced control over torque and power. Driven by a stepper motor, this clock features four dials displaying the hour, minute, and two-second hands.

More than a clock, Hima is an educational journey. Crafted from various materials, it offers insights into gear systems, electronics, and coding, inspiring students and enthusiasts alike.

Designed for customization, Hima seamlessly merges functionality with art, appealing to those who seek innovation with an artistic touch. Witness time in a symphony of art and innovation.



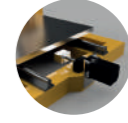
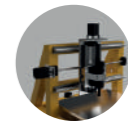
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MKHITAR EVOYAN

DIY CNC REVOLUTION

MACHINES THAT MAKE MACHINES



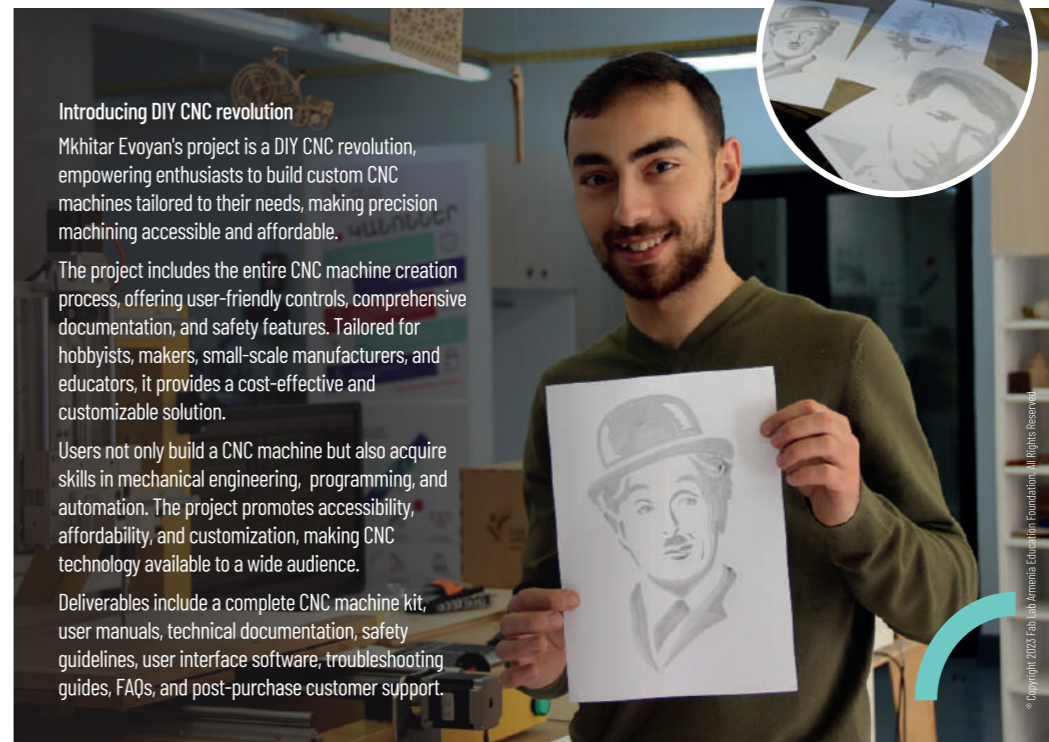
Introducing DIY CNC revolution

Mkhitar Evoyan's project is a DIY CNC revolution, empowering enthusiasts to build custom CNC machines tailored to their needs, making precision machining accessible and affordable.

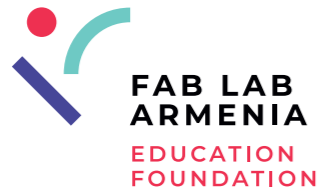
The project includes the entire CNC machine creation process, offering user-friendly controls, comprehensive documentation, and safety features. Tailored for hobbyists, makers, small-scale manufacturers, and educators, it provides a cost-effective and customizable solution.

Users not only build a CNC machine but also acquire skills in mechanical engineering, programming, and automation. The project promotes accessibility, affordability, and customization, making CNC technology available to a wide audience.

Deliverables include a complete CNC machine kit, user manuals, technical documentation, safety guidelines, user interface software, troubleshooting guides, FAQs, and post-purchase customer support.



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EFI FARMAKI PAR

A DANCE OF LETTERS AND MOVEMENT



Introducing Par

Experience the allure of movement with Efi Farnaki's PAR, a mobile suspension installation comprising three Armenian letters forming the word պար meaning dance.

This captivating piece invites those nearby to join in a spontaneous circle dance, creating a dynamic and engaging communal experience. Dive into the rhythm and embrace the spirit of PAR as it transforms the surrounding space into a celebration of movement and togetherness.



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MAMIKON MIKAYELYAN INCEPTION

A SCULPTURE OF LIFE'S GENESIS



Introducing Inception

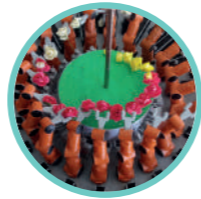
Mamikon Mikayelyan's Inception is an artistic journey into the genesis of life. This sculpture opens into a small universe, symbolizing the crucible of existence. As visitors cradle a small sphere in their hands, representing an ovum, a subtle vibration begins.

Placing it in the center of the sculpture reveals a mesmerizing dance of luminous shapes, embodying spermatozoa and symbolizing the extraordinary journey of life's inception. This immersive artwork invites contemplation and connection with the profound mysteries of existence.



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MAXIME RICHARD AKNTART

3D PRINTED SCULPTURES IN ACTION



Introducing Akntart

Seamlessly merging ancient animation with modern 3D printing and LEDs, Akntart is an interactive zoetrope by Maxime Richard that captivates with creativity and education.

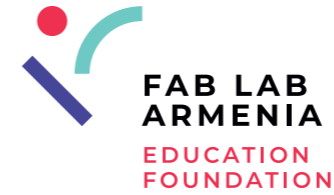
This zoetrope explores 3D printing and animation through 3D printed solids and stroboscopic LEDs, making it ideal for art galleries, science museums, and educational settings.

The project involves design, manufacturing, and electronics, featuring 3D printed sculptures, CNC-cut parts, and synchronized operation with a printed circuit board (PCB).

Akntart appeals to art enthusiasts, children, families, hobbyists, makers, and educational institutions. Challenges in printing time optimization and synchronization between the motor and LEDs were overcome, resulting in a mesmerizing 3D printed zoetrope. Open-source manufacturing descriptions and design files accompany this project, making Akntart a catalyst for curiosity, innovation, and creativity.



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ANOUSH ARSHAKYAN METAMORPHOSIS



Introducing Metamorphosis

In the heart of Fab Lab Armenia and a steel factory, Anoush Arshakyan crafted Metamorphosis, an art piece embodying the journey of personal transformation—a butterfly emerging from its cocoon.

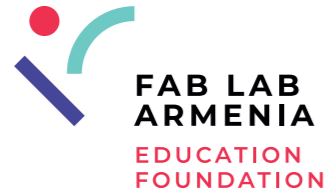
Inspired by the artist's Fab Academy 2023 experience, this masterpiece seamlessly blends digital techniques, showcasing a fusion of craftsmanship and technology. Steel wings symbolize moments of soaring freedom and suspended progress, encapsulating the transformative power of education and artistic expression.

What makes Metamorphosis truly enchanting is its responsiveness to the laughter of children nearby. A sound sensor breathes life into the butterfly, making it a symbol of shared joy and experiences.

Targeting students, educators, art enthusiasts, and tech innovators, Metamorphosis beckons individuals to embark on their creative journeys. It's a celebration of the fusion of digital and tangible art forms, an invitation to reflect on personal growth, and a testament to the magic of education and artistic exploration.



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HOVHANNES HARUTYUNYAN

HISTORY BOX

RELIVING THE PAST



Introducing History Box

Hovhannes Harutyunyan, a dedicated history teacher, collaborated with Fab Lab Armenia to create the History Box.

This innovative project unfolds as a mobile exhibit, showcasing the meticulously crafted crown of King Tiridates III and a historical cross.

These mobile exhibits travel to various schools, turning history lessons into immersive experiences. In his role as a history teacher, Hovhannes employs interactive methods, captivating students in a tactile exploration of historical artifacts. The Tiridates III crown and cross serve as tangible links to the past, making history a vibrant and unforgettable subject.

The History Box project is more than an educational initiative; it's a testament to how collaboration between a passionate teacher and Fab Lab Armenia can transform abstract historical texts into tangible, memorable experiences for students across different schools.



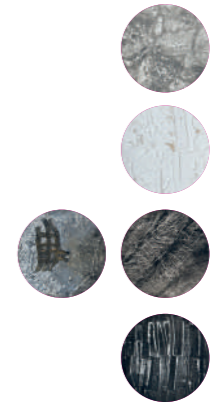
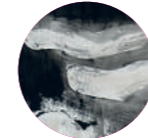
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HASMİK SOGHOMONYAN

ECOART HARMONY

CRAFTING BEAUTY FROM WASTE



Introducing EcoArt Harmony

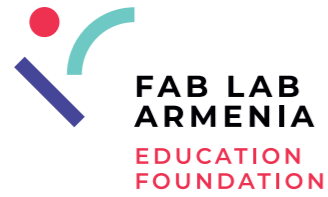
In EcoArt Harmony, guided by Hasmik Soghomonian, students explore the realm of crafting beautiful decorations using diverse materials, with a distinctive emphasis on repurposing various wastes to shed light on ecological issues.

This project serves as a creative haven for students inclined towards modern materials, new technologies, and expressing their creativity through interior design. With a thematic orientation, EcoArt Harmony embodies a clear ideology, goal, and message, utilizing decorations as powerful vehicles of expression. Hasmik Soghomonian, in her role as a teacher, guides and stimulates creative thinking, encouraging students to find independent solutions.

The essence of EcoArt Harmony lies in both creating a visually enchanting environment through decorative items and addressing environmental challenges by transforming various wastes into works of art. This project not only elevates artistic skills but also instills a sense of responsibility and creativity in addressing pertinent ecological issues.



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ANAHIT APINYAN ASKING QUESTIONS

GRAMMAR WHEEL UNLEASHED



Introducing Asking Questions

Asking Questions - Developing Inquiry Skills by Using Grammar Wheel by Anahit Apinyan stands at the forefront of Assistive Technology, reshaping English education for teachers and students alike.

This initiative introduces a practical tool designed not just to refine grammar skills but also to cultivate the art of posing thoughtful and insightful questions—the Grammar Wheel.

In this transformative venture, the Grammar Wheel transcends its role as a tool; it becomes a catalyst for empowered teaching and profound questioning. Educators, equipped with this innovative resource, not only impart comprehensive grammar knowledge but also inspire students to approach language with a sense of inquiry.



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HASMİK SOGHOMONYAN

ARMENIAN ALCHEMY

UNVEILING JEWELRY ART



Introducing Armenian Alchemy

Armenian Alchemy, led by Hasmik Soghomonyan, immerses students in Armenian jewelry art, merging chemistry and artistic expression. Crafted for those passionate about jewelry, metalwork, and Armenian culture, the project fosters self-expression. Implemented at Dilijan Central School, this project epitomizes project-based learning, integrating applied knowledge from Chemistry and Art.

The outcome is Armenian jewelry, a testament to creative metal processing. Collaborating with chemistry teacher Gayane Minasyan, Hasmik ensures a holistic approach, deepening students' understanding of both science and art.



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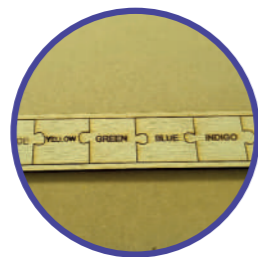
ANI BEJANYAN RAINBOW PUZZLE



Introducing Rainbow Puzzle

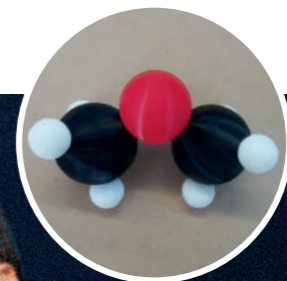
Ani Bejanyan's Rainbow Puzzle creatively teaches the seven colors of the rainbow in an interactive and engaging way. Designed for elementary school teachers, this project transforms color learning into a dynamic and enjoyable experience.

The puzzle blends play and education, capturing young minds and fostering a lasting understanding of colors. It stands as a symbol of innovative and impactful teaching tools, making education both immersive and enjoyable.



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MAXIME RICHARD BUILDING BLOCKS OF KNOWLEDGE 3D PRINTED MAGNETIC MOLECULES



Introducing Building Blocks of Knowledge

Maxime Richard's project revolutionizes chemistry education by combining 3D printing and magnets to create interactive, magnetic molecule models. These models, made of 3D printed atoms, provide a hands-on approach to learning about molecular structures and chemical bonds.

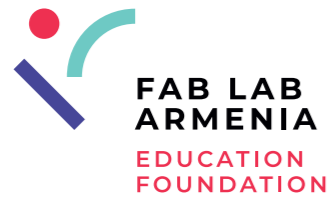
Different from traditional kits, this project uses magnets, significantly speeding up construction and dispelling misconceptions about energy release and bond formation. The primary goal is to enhance the teaching of chemistry through an accessible and engaging learning experience.

The project covers 3D modeling, printing, and testing, offering a comprehensive journey through mathematics, engineering, and chemistry. It aims to bridge accessibility gaps by achieving industrial product quality with available tools. In addition to the kit of magnetically snapping atoms, Maxime provides an open-source description and design files, fostering collaborative innovation in education.

Building Blocks of Knowledge transforms chemistry education, making it accessible, engaging, and hands-on for students and educators alike.



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LILIT HARUTYUNYAN UNLOCKING DILIJAN

EXPLORE WITH ENGAGING FLASHCARDS



Introducing Unlocking Dilijan

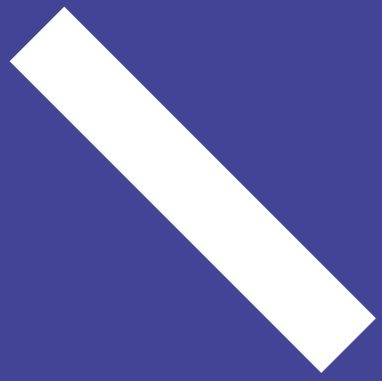
These flashcards share unique insights into Dilijan's rich heritage—stories of notable individuals, natural wonders, and captivating local folklore.

In brief narratives, explore Dilijan's achievements, scenic beauty, and enchanting folklore, providing a deep connection to our town's essence.

Tailored for teachers, students, and visitors, these flashcards showcase Dilijan's character. Beyond information, the project introduces an enjoyable challenge—a puzzle revealing a complete map, adding an element of adventure.

Experience the richness of Dilijan. This project isn't just an exhibit; it's an exploration, an invitation to appreciate and celebrate our community's distinct tapestry.

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PART TWO

2

THE ESTABLISHMENT OF:
FAB LAB ARMENIA
EDUCATION FOUNDATION



CBA SPINS OUT FAB LAB ARMENIA DILIJAN TO CREATE AN EDUCATION FOUNDATION WITH AN EXPANDED MISSION

FAB LAB ARMENIA Education Foundation
Officially registered on August 8th of 2023.

DARE TO EXPRESS AND CO-CREATE!

OUR VISION

Support curious minds and daring doers to imagine the impossible and innovate the status quo.

It is a multi-cultural, multi-generational hive of creativity and entrepreneurship, where people come together to imagine a better way and then make it happen with their own hands.

OUR MISSION

Connect, Empower, and Transform the Community.

Through access to state-of-the-art digital manufacturing technologies and global learning communities, curious minds can come together to play, experiment, innovate and co-create solutions to local problems, for the greater global good.

OUR VALUES

COMMUNITY: Transforming communities through the power of connection, exchange and collaboration

CO-OPERATION: Sharing ideas, resources, tools and technologies on a local and global level.

CREATIVITY: Dreaming, designing, prototyping and testing the innovations of tomorrow.

CURIOSITY: Asking new questions and exploring limitless possibilities.

COURAGE: Daring to believe that anything can happen when we take the first step.

Dare to Express and Co-Create!

Imagine a community where people dare to envision a shared future and then set out to make it real—this is the essence of Fab Lab Armenia. Here, “daring to imagine” is more than just hoping for a better world; it’s an invitation to shape it actively. This is a place for those who want to create solutions to environmental challenges, advance technology for social good, or develop skills to strengthen local economies.

Fab Lab Armenia is home to a network of doers, who dare to dreamer and imagine. People from all walks of life bring unique skills, knowledge, and perspectives, creating a

Board members and speakers gathered at the Fab Lab Armenia Conference, Next is Now!, showcasing their dedication to education, innovation, technology, and the future of digital fabrication.



synergy beyond individual efforts. They explore ways to design, prototype, and experiment through collaboration, making ideas tangible and learning with every step.

The motto “make it happen with your own hands” underlines a commitment to hands-on, experiential learning. This process builds practical skills—such as coding, designing, and problem-solving—and fosters confidence that real change is achievable. Members of Fab Lab Armenia aren’t just working on projects; they’re transforming their lives, communities, and futures through action, all within a culture of continuous learning and mutual support.

It is easier than you think!

The Fab Lab Armenia team opens its doors every Saturday, welcoming everyone to explore the possibilities of digital fabrication. For many, it starts as simple curiosity, perhaps sparked by a friend or family member. Through the guidance of experienced Fab Lab mentors, novices are introduced to safety protocols, the capabilities of different machines, and the excitement of quick prototyping. This cross-generational, community-based learning approach ensures that everyone—from age 7 to 77—can open their minds and experience the joy of creation.

It is more complex than you think!

Much like a skilled dancer making difficult and very skilled moves look effortless, Fab Lab Armenia’s team, trained through Fab Academies and an in-depth curriculum, expertly coaches participants, guiding them in transforming intangible ideas into physical realities. With each prototype, members feel an “aha!” moment that ignites curiosity and a love of learning.

When participants encounter a challenge that stretches their knowledge, they have a community ready to support them. And if local resources aren’t enough, the Fab Lab network connects people globally; members can tap into expertise from thousands of labs worldwide 24/7. In fact, it has been recorded that around 250 individuals are active within the Fab Lab network at any given moment of the day and night, creating a unique blend of local and global collaboration.

It is about a Fab Lab at a time and how it positively impacts our world!

We often discuss the power of networks without fully understanding how they operate, as they can seem overwhelming and complex. The Fab Lab model of distributed learning and decentralized idea incubators brings this concept to life, showing how it works effectively on both small and large scales, bridging local and global connections. This model represents a transformative shift in how we approach thinking, designing, and creating. It opens a new era where local communities, grounded in specific places, seamlessly connect to global networks that transcend physical boundaries, bound together by shared ideas, knowledge, and aspirations.

A project that is both a local and global initiative

Fab Lab Armenia has launched a major effort to implement online chemistry labs. We are preparing for a nature conservation project focused on water and river cleanup, aiming to teach children how to conduct online lab tests for their local rivers and water sources. This initiative benefits the environment while enriching STEM education in schools. Engaging local communities and connecting with global efforts can foster a sense of shared responsibility and inspire practical solutions; it is also about shared knowledge since such projects are already successfully implemented in other parts of the world. Activities will include water quality testing and data collection through apps and sensors.

Our first step involved partnering with Labster, Denmark’s premier science education platform, and the Ministry of Education in Armenia. We aim to reach as many schools as possible, transforming children, teachers, their families, and communities into active citizen scientists. Fab Lab Armenia teaches how to design a range of sensors for testing to do data collection, which can be uploaded to virtual chemistry labs at local and regional levels. This will enable us to trace the health of rivers from their source to their descent into lakes.

There is nothing more satisfying than witnessing how every seed of good work and rich idea starts small, gathers enthusiasm, is organically nurtured to welcome continuously added inputs and efforts, and eventually grows beyond our expectations.

MISSION EXPANDED,
BEYOND SERVING
COMMUNITIES, GROWING
INTO A **NATIONAL
TECHNOLOGY HUB** FOR
DISTRIBUTED LEARNING
AND TRAINING IN DIGITAL
MANUFACTURING



THE NEED FOR A LEAPFROG STRATEGY

Building the Foundation for a Strong Network and Productive Ecosystem of Stakeholders.

A "Distributed Super Fab Lab" to support Digital Manufacturing Networks in the country

We need to build key partnerships with existing manufacturing companies. Different environments can provide access to the machine environment needed to embrace the culture of "machine building machines". Slowly and steadily, we can start equipping schools in need of equipment.



Digital Fabrication: A Strategic Pathway to Economic Growth and Workforce Upskilling

Fab Lab Armenia fosters digital fabrication skills and is actively working to establish a network of Fab Labs across the nation. As Armenia embarks on a transformative journey towards innovation and technological advancement, we are positioned to lead this change. Our dual mission focuses on creating accessible Fab Lab spaces and enrolling participants in Fab Academy programs, equipping today's workforce with missing essential skills for the digital era.

Leveraging Existing Ecosystems

Our initiative seeks to maximize the potential of established resources, including Armath Labs, COAF centers, the REAL School, the Aren Mehrabyan Foundation, and more to come. Collaborative partnerships with organizations further strengthen our strategic network, enhancing our collective impact.

Establishing Fab Labs Nationwide

We aim to build creative digital manufacturing hubs strategically placing Fab Labs throughout Armenia. These spaces will serve as educational centers that foster community engagement and collaboration among a diverse range of stakeholders, including educators, students, entrepreneurs, artisans, and local businesses.

Our proposal involves upgrading existing labs to accelerate the development of innovative projects that address local challenges while aligning with global trends.

Investing in Human Capital

Fab Lab Armenia is focused on building a workforce proficient in design, prototyping, and manufacturing. We are enrolling key individuals from the education, public, and private sectors into Fab Academies. This investment in human capital enhances employability and cultivates a culture of innovation and entrepreneurship.

Distributed "Super Fab Lab"

While waiting for a Super Fab Lab, Fab Lab Armenia established a "Distributed Super Fab Lab" approach that connects its



↑ Three Pathways to Knowledge: ** Distributed learning bridges distances, empowering learners to collaborate, share insights, and grow together regardless of time or place.

A Success Story

An example of our initiative's impact is Ashot Margaryan, a Fab Academy alumnus and head of a steel manufacturing company in Yerevan. He has been instrumental in coaching peers at Fab Lab Armenia in metal casting, successfully producing a cast iron manhole cover for the neighborhood sewer line. This project addressed immediate community safety concerns and provided Ashot with insights that led to a reconfiguration of his own factory's layout, resulting in doubling its output.

Equipping Schools for Future Innovation

We are committed to equipping schools with the tools and resources necessary to integrate digital fabrication into their curricula. This hands-on approach will empower students to become creators rather than mere consumers of technology, sparking their interest in STEM fields and preparing them for careers in a digital world.

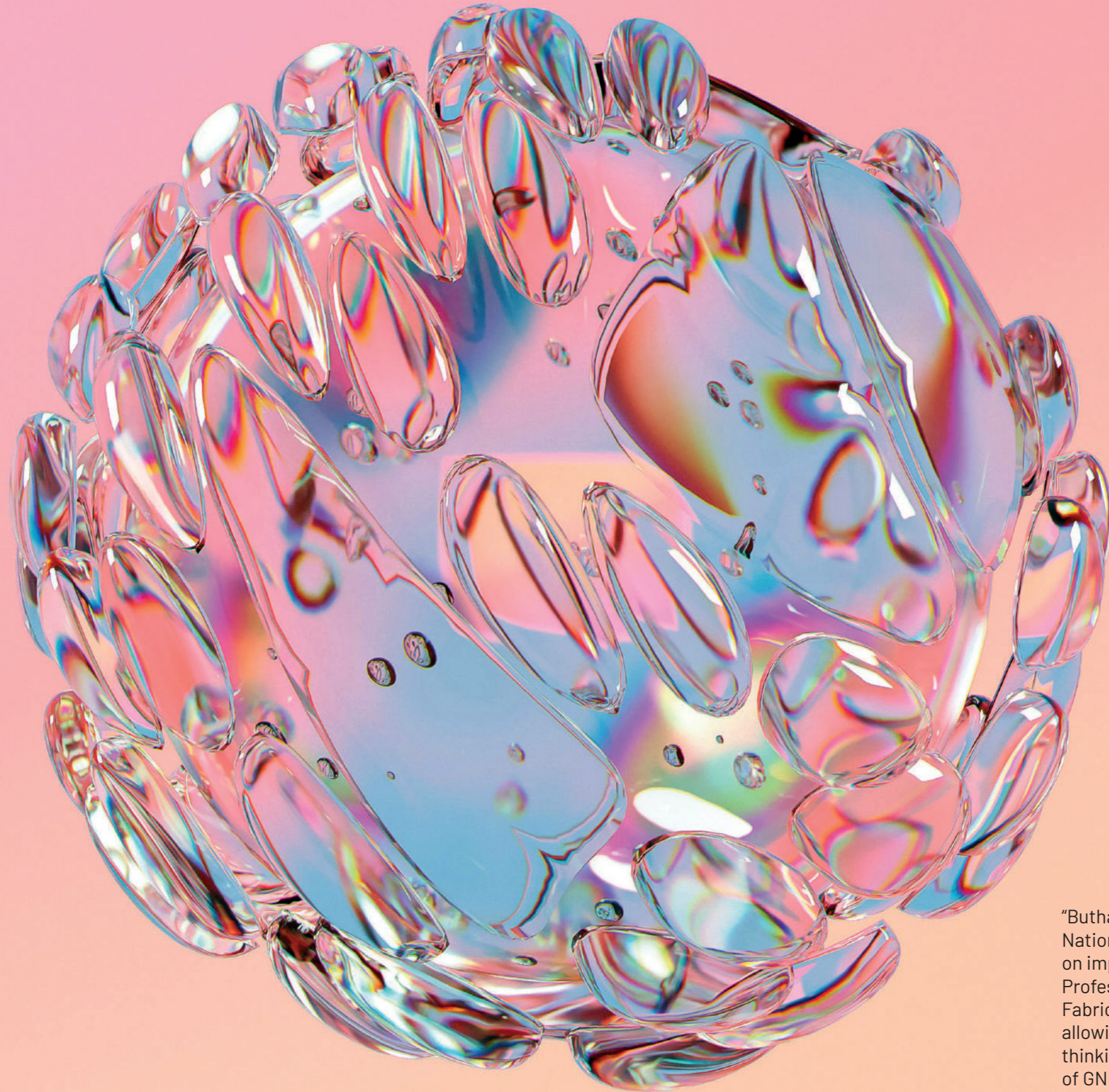
Conclusion

By cultivating a vibrant network of Fab Labs and digital fabrication skills in Armenia, we are laying the groundwork for economic growth and innovation. Fab Lab Armenia aims to transform Armenia into a hub of creativity and technological advancement, positioning the nation as a leader in the global digital fabrication landscape.

Upcoming Step Forward

We are excited to announce the establishment of a new Fab Lab Armenia hub within the State Academy of Fine Arts in Gyumri, thanks to the strategic partnership with The Katapult/AGBU project.

SHARED OBJECTIVES



"Buthan's biggest constraint in promoting Gross National Happiness (GNH) is its heavy reliance on imports at the end of long supply chains. MIT Professor Niel Gershenfeld shows that Digital Fabrication can overcome this constraint by allowing our country to fabricate locally while thinking globally and being true to the principles of GNH. We are looking forward to Buthan becoming not only a Fab City but a Fab Country."
-Tshering Tobgay, Prime Minister of Buthan

FAB LAB ARMENIA: EXPERT AND CATALYST FOR IMPACTFUL COLLABORATIONS

1. Support to the Ministry of Education through Shared Online Hybrid Education Platforms

Fab Lab Armenia will support upgrading the STEAM education Curriculum and the Reskilling of Educators for the country's high schools and universities. Creating, developing, and implementing new curriculum and content.

Partnership with Centers of Excellence
MIT /Fab Foundation & Fab Academy
Organization run by MIT researchers for the Creation of new skills, products, and services for the Digital Economy
LABSTER Online Science Labs
A world leader company for virtual labs and science simulations.

2. Expand the network of Fab Labs in Armenia among public and nonpublic organizations in the country and all domains of Knowledge.

Helping create, set, manage, staff, and connect Fab Labs within high schools, universities, and public and private Learning Organizations in Armenia and globally.

3. Teaching and Training Educators and the Work Force for the Digital Economy.

Creating Fab Academy programs that are crafted for educators, artisans, entrepreneurs, and experts in the Creative Industries in general.
Co-creating an International Certification in Digital Fabrication for Education and emerging new professional skills. It will help Fab Labs in schools or Learning Centers hire and train new Facilitators and Teachers for their Fab Labs/maker spaces.

4. Active Voice in A Global Network

The Lab is shaped by and for the local community, but we are also ready to step up and make our voices heard in the global conversation, through the Fab Lab Armenia network of knowledge-sharing and co-creation and the growing range of Fab Academy programs.

5. Bridging The Gap

We are on a mission to seed the digital manufacturing culture that shapes the way we work, learn, play, create, produce, and do business. We bridge the gap between local people, world-leading technologies, and a global learning community, so that anyone can come, explore, and discover

how to become an active member of the creative force. Fab Lab Armenia will host expert instructors through its artists and scientists who are in residence.

6. Support And Resource Center for Start-Ups and Entrepreneurship

Fab Lab Armenia will offer mini workshops that foster innovation, encourage and facilitate technological prototyping, and by extension, facilitate the creation of new companies. Often, for young companies, an investment in purchasing prototyping machines is essential but costly, access to a fab lab ready to go from idea to product is a major boost ahead.

7. Support Artisans and Traditional Crafts to Be Rediscovered And Grow.

Fab Lab networks create an ecology of distributed and sustainable technological training through digital manufacturing. Each Lab becomes a node for a specific body of knowledge and training and is complementary to other fab labs in the network locally, regionally and internationally. By integrating digital fabrication technologies with traditional artisanal practices, fab labs empower artisans to enhance their craft, innovate, and thrive in today's rapidly changing technological landscape. Fab Lab Armenia will offer entrepreneurial support programs and mentorship opportunities to help artisans turn their craft into viable businesses.

8. Fab Lab Armenia Plans to Provide Marketing Platforms, Both Online And Offline, To Promote Artisans' Products And Services.

Fab Lab Armenia and its networks of Labs will host exhibitions, showcases, and events where artisans can display their creations. This exposure will help "Fab Labbers" gain visibility, attract potential customers, and receive feedback from a diverse audience.

9. Fab Lab Armenia will assist Investors and Business Leaders connect with meaningful projects.

For investors and business leaders, Fab Lab Armenia can offer several benefits when it comes to connecting with meaningful projects:

DESIGNING REALITY

How to Survive and Thrive in the Third Digital Revolution

↑ Designing Reality by Neil Gershenfeld and co-authors explores how digital fabrication, like 3D printing and Fab Labs, is driving a "third digital revolution," empowering individuals to create and transforming society and economies.

Access to a diverse project pool:

Fab Labs attract a diverse community of makers, innovators, and entrepreneurs. This provides investors and business leaders with access to a broad range of projects spanning various sectors and industries. They can explore projects aligned with their interests, investment goals, or business strategies.

Physical prototyping and validation:

Fab Labs enable project creators to transform their ideas into tangible prototypes. This allows investors and business leaders to assess the viability and potential of a project firsthand. They can examine the quality of prototypes, evaluate the innovation level, and gain insights into the technical feasibility of a project before committing resources or capital.

Networking opportunities:

Fab Labs foster a collaborative environment where individuals with different skill sets, and expertise come together. Investors and business leaders can leverage this environment

to network with innovators, subject matter experts, and potential co-founders or partners. Building relationships within the Fab Lab community can lead to new investment opportunities or partnerships with promising projects.

Early-stage investment prospects:

Many projects in Fab Labs are in their early stages. Investors and business leaders looking for early-stage investment opportunities can identify and support projects with high growth potential. By getting involved at an early stage, they can provide valuable guidance, mentorship, and resources to help these projects scale and succeed.

Social impact and sustainability focus:

Fab Labs often embrace projects with a strong social impact or sustainability focus. This aligns with the growing trend of impact investing and the increasing emphasis on corporate social responsibility. Investors and business leaders interested in supporting meaningful projects that contribute to positive social or environmental change can find suitable opportunities within the Fab Lab ecosystem.

Fab Labs view an ecosystem as a living entity dynamically evolving through interaction, adaptation, and co-creation. This perspective emphasizes the network's shared goals and collaborative efforts, which emerge naturally when innovators share access to a digital fabrication environment.

Fab Lab Armenia also supports startups by providing access to cutting-edge technology and fostering a network that offers valuable feedback on prototyping products and services. This hands-on support helps startups build more convincing pitches and showcase tangible prototypes, bridging the gap between concept and reality.

To fully reflect the vibrancy of the ecosystem, Fab Lab Armenia advances the mapping process to capture the nuances of connections—identifying who is part of the network and how organizations interact, share knowledge, collaborate, and co-invent.

Connecting to technology resources and a supportive community allows Fab Lab Armenia to enable people to bring impactful solutions to life. This is when ideas thrive, solutions emerge, and collective impact is amplified.

ANNEX INFORMATION

"If the last 70+ years have told the story of atoms converted into bits, then the next will be the story of bits being turned back into atoms... scenarios of a not so far future highlight the possibilities and the challenges that computer based fabrication offers."

Vint Cerf, Vice President and Chief Internet Evangelist at Google.



FAB LAB ARMENIA GOVERNANCE



Fab Lab Armenia welcomes the visit of Salvator Perez-Galindo, Senior Advisor of Global Government Engagement at VISA and Armen Nurbekyan, Deputy Governor of CBA and Chairman of the Board for Fab Lab Armenia.



↑ Martin Galstyan, Governor of The Central Bank of Armenia is brainstorming with UWC student Ruslan Guindullin a volunteer at Fab Lab Armenia to teach creative coding to local youth.

↑ Fab Lab Armenia is always ready to welcome guests and share the latest developments, inventions and courses in Digital Fabrication.

Board Members

Armen Nurbekyan, Deputy Governor of The Central Bank of Armenia

Nerses Yeritsyan, Director of the Information Systems Agency of Armenia, former Deputy Governor of The Central Bank of Armenia, former Minister of Economy

Jacqueline Karaaslanian, CEO and Co-Founder of Learning Architects, LLC

Tatevik Khachatryan, Deputy Chairman of the Management Board Evoca Bank

Ara Barsam, CEO of Children of Armenia Fund

Linn Paravyan, Serial Entrepreneur, Founder of the Meeting Point Artists Residency, Founder and President of OWS Foundation

Anna Gargarian, Founder and Lead of Katapult, Creative Accelerator Program at AGBU, Co-Founder of Advocacy Society for the Arts (ASA)

Michel Davoudian, CEO of Apaga Technologies and Board Member of CCIFA French-Armenian Chamber of Commerce

Fab Lab Armenia thrives under the guidance of an exceptional and visionary board whose members bring a wealth of experience across diverse fields. Each board member contributes unique, complementary expertise, creating a synergy that propels the organization toward its mission: to connect, empower,

and transform communities through access to state-of-the-art digital manufacturing technologies and global learning communities. This mission allows curious minds to come together to play, experiment, innovate, and co-create solutions to local problems for the greater global good.

Rooted in the core values of Community, Cooperation, Creativity, Curiosity, and Courage, Fab Lab Armenia fosters an inclusive environment where collaboration and innovation can flourish. The board's commitment to these values empowers them to cultivate a vibrant community focused on reskilling the workforce and seeding the new digital fabrication economy.

By embracing a forward-thinking approach, they aim to equip individuals with the skills needed to thrive in a rapidly changing landscape, ensuring that the community can adapt to and lead in the digital age. With a bold vision to create a robust ecosystem of digital fabrication, Fab Lab Armenia balances long-term aspirations with a grounded understanding of immediate workforce needs. This dynamic approach enables the organization to drive meaningful change while remaining deeply connected to Armenia's needs and ultimately expanding its impact on a global scale.

A quick glance at the board's expertise reveals a rich mosaic of skills and experience that spans a wide array of disciplines, each contributing to the multifaceted vision of Fab Lab Armenia. The board members bring diverse backgrounds, from finance and entrepreneurship to deep learning, artificial intelligence,

and the creative arts, each adding a unique perspective that enhances the organization's strategic direction.

In finance, members leverage their expertise to ensure sustainable growth and sound investment in innovative projects. Those rooted in entrepreneurship provide invaluable insights into business development and startup culture, fostering an environment where new ideas can flourish. The presence of experts in deep learning and artificial intelligence equips the board with cutting-edge knowledge, allowing Fab Lab Armenia to remain at the forefront of technological advancements and seamlessly integrate these innovations into its programs.

Moreover, the board includes members skilled in policymaking who understand the processes involved in proposing frameworks that embrace the changes new technologies bring into our lives. Their expertise in navigating regulatory landscapes and advocating for supportive policies ensures that Fab Lab Armenia can effectively influence and adapt to the evolving technological environment. Additionally, the inclusion of members with backgrounds in the arts and creative fields emphasizes the importance of creativity and design thinking in problem-solving and innovation. Their experiences contribute to seeding the creative culture industries, encouraging the exploration of artistic expression and collaborative projects that drive cultural engagement and community empowerment.

This diverse blend of skills and perspectives among the board members enriches the decision-making process and ensures that Fab Lab Armenia is well-equipped to address the challenges of the modern world while fostering a thriving community dedicated to learning and innovation.

CORE STAFF MEMBERS



ANOUSH ARSHAKYAN
Fab Academies Support
Instructor and Creative Content Developer
Lead for Fabricademy Programs
Fab Lab Armenia Education Foundation
Dilijan



MAXIME RICHARD
Fab Academies Support Instructor
Pedagogical Content Developer
Lead of "Labster" hybrid Education Science Programs
Lead of Fab Learning Academy for Educators
Fab Lab Armenia Education Foundation
Dilijan



RUDOLF IGITYAN
Fab Academies Support Instructor and Lab Engineer
Lead for Open-Source Machine Building Programs
Fab Lab Armenia Education Foundation
Dilijan



TATEVIK SAHAKYAN
Legal Officer
Fab Lab Armenia Education Foundation
Dilijan



BABKEN CHUGASZYAN
CEO
Fab Lab Armenia Education Foundation
Dilijan

TALENT CULTIVATION IN PROCESS



Fab Lab Armenia: Cultivating Talent, Skills, and Knowledge for a Thriving Future

Fab Lab Armenia is actively preparing people of all ages to acquire fluency in digital fabrication through formal fab academy programs and through weekly programs for nonformal training of the community at large.

Fab Lab Armenia: An Investment in the Future!

In today's rapidly evolving landscape, it takes a robust network to discover, nurture, and develop talent and skills effectively. As the world increasingly demands innovative solutions to complex challenges, the search for new talent has never been more critical. At Fab Lab Armenia, we believe that fostering a culture of creativity and innovation is essential for building a sustainable future.

Understanding Talent, Skill, and Knowledge

Talent, skill, and knowledge are distinct yet interconnected concepts that collectively shape an individual's capabilities:

Talent refers to innate abilities and natural inclinations that vary from person to person. It is often what draws individuals to specific areas of interest and can spark passion and creativity.

Skill represents the proficiency that individuals gain through practice and experience. Skills are cultivated over time, transforming raw talent into effective performance and enabling individuals to execute tasks with confidence and expertise.

Knowledge encompasses the understanding that comes from learning and education. It serves as the foundation upon which skills are built, and talents are refined, allowing individuals to make informed decisions and apply their abilities effectively.

While these concepts may overlap, each plays a unique role in developing a person's potential. We can forge a powerful coalition that drives sustainable growth and innovation by integrating talent, learning, workforce planning, and people analytics.

The Global Search for New Talent is looking at Fab Labs and their Networks of New Talents.

As we face unprecedented challenges in areas such as technology, climate change, and social equity, the global economy needs innovative thinkers and skilled workers to address these issues. Organizations around the world are actively searching for new talent that can bring fresh perspectives and solutions to the table. The demand for individuals who possess a unique blend of creativity, technical skills, and a growth mindset is surging.

Moreover, as industries continue to evolve with rapid

↓
Brice Ammar Khodja, Researcher, Artist, and Scientist. He is leveraging digital technologies to study active materials, residual matter, and nature conservation.



technological advancements, the need for reskilling and upskilling has become paramount. Companies are looking for workers with existing skills who are adaptable and willing to learn continuously. This dynamic landscape creates a tremendous opportunity for initiatives that cultivate new talent, particularly in environments that promote experimentation and collaboration.

The Role of Fab Labs in Unleashing Potential

Fab Lab Armenia provides an inspiring environment that opens minds and cultivates potential in unexpected ways. Here, individuals can explore their creativity, collaborate with

peers, and experiment with cutting-edge technologies. The hands-on, project-based nature of Fab Labs encourages exploration and learning through doing, allowing participants to discover new interests and develop valuable skills in a supportive community.

By investing in initiatives that harness the synergy of talent, skills, and knowledge, Fab Lab Armenia aims to empower individuals to reach their full potential. We are committed to fostering an ecosystem that nurtures innovation and prepares the workforce for future challenges.

In this context, Fab Lab Armenia stands as a beacon of opportunity, drawing in individuals from diverse backgrounds to cultivate their talents and skills. We are dedicated to creating pathways for aspiring innovators and changemakers, ensuring they are equipped to thrive in a competitive global marketplace.

At Fab Lab Armenia, we teach new skills and shape a brighter future for individuals and communities!

The Art of Revealing The Untapped Talent And Skills Within Individuals

The Fab Academy distributed learning program is designed to unlock students' potential through a hands-on, project-based approach that emphasizes learning by doing. Over an intense six-month period, participants engage with a wide array of knowledge domains, from digital fabrication and electronics to programming and design.

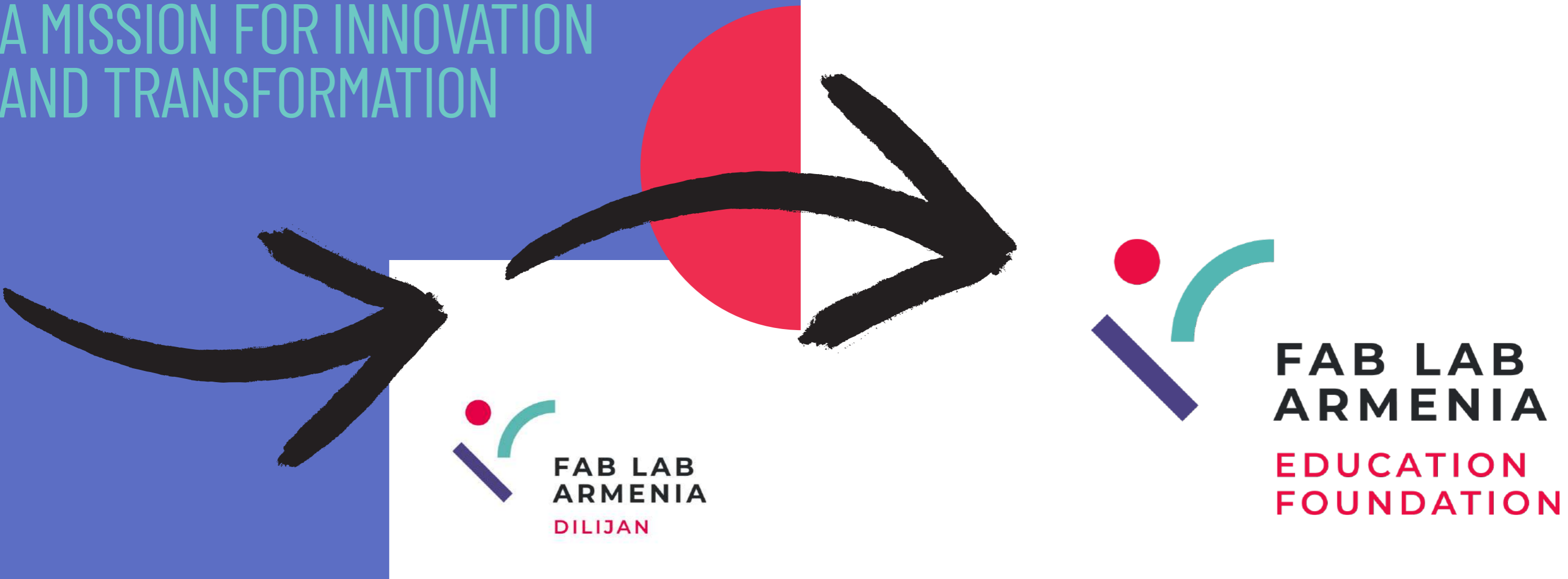
This immersive experience allows them to internalize concepts deeply, achieving in six months what would typically take three years of traditional education.

A key aspect of Fab Academy is its ability to unlock untapped talent and skills within individuals. Many participants come with hidden abilities, even to themselves, or interests that traditional education may never fully recognize or nurture. Through real-world projects that encourage creativity and problem-solving, students can explore these talents and apply theoretical knowledge to practical situations. This active learning environment fosters a "can-do attitude," empowering individuals to tackle challenges with confidence and resilience nurtured by a very attentive and multi-talent network.

As they progress, students gain technical skills and develop critical thinking, collaboration, and adaptability—essential competencies for navigating today's fast-paced world. The program helps participants discover their potential and strengths, allowing them to realize their capability to innovate and contribute meaningfully.

Through this transformative journey, participants build a strong sense of community and cooperation, drawing on their peers and instructors' collective knowledge and support. By the end of the program, graduates emerge as empowered, resourceful individuals ready to take on new challenges, equipped with the mindset and skills to innovate and utilize their unique talents for the greater good of their fields and communities.

EMPOWERING ARMENIA: A MISSION FOR INNOVATION AND TRANSFORMATION



↑ The original brand logo for Fab Lab Armenia, Dilijan, represented an avant-garde program dedicated to raising awareness about the emerging Digital Fabrication economy. It provided access to a Fab Lab, its global network, and Fab Academy courses created by visionary pioneer and MIT professor Neil Gershenfeld.

↑ The updated brand logo marks the transition from a dynamic program to an independent foundation. Fab Lab Armenia, Education Foundation, champions equitable access to Digital Fabrication, providing world-class distributed learning and training opportunities to passionate learners and practitioners across the nation and beyond.

Armenia's Innovation Revolution: From Local Community to a National Network

Fab Lab Armenia is evolving from a single community-based hub to a vibrant, nationwide network of interconnected communities. This transformation empowers Armenians across the country to access advanced digital manufacturing technologies, fostering collaboration and innovation. By scaling its efforts, Fab Lab Armenia builds a cohesive network where every individual and region contributes to solving challenges, creating opportunities, and strengthening the nation's collective creative potential.

Expanding Access and Connectivity

At the heart of this movement is the seamless integration of local and regional communities into a unified platform for creativity and knowledge-sharing. Fab Lab Armenia links rural villages, urban centers, schools, and industries, providing tools and resources to spark innovation in every corner of the country. By fostering partnerships with educators, entrepreneurs, and civic leaders, it creates opportunities for lifelong learning, skills development, and entrepreneurial growth, while strengthening the social fabric of Armenian society.

A Platform for National and Global Leadership

Fab Lab Armenia's national community is also a platform for global engagement. As part of the international Fab Lab network, it enables Armenians to exchange ideas, share innovations, and contribute solutions to global challenges. By showcasing Armenia's unique strengths and ingenuity on the world stage, Fab Lab Armenia enhances the country's reputation as a hub for creative problem-solving and technological advancement, building a future where innovation knows no boundaries.



PART THREE

GRATITUDE TO OUR
SPONSORS: CENTRAL BANK
OF ARMENIA (CBA) AND TO
EVOCA BANK



GRATITUDE:



ARMEN NURBEKYAN
Deputy Governor of Central Bank of Armenia



NERSES YERITSYAN
Acting Head of Information Systems Agency of Armenia



TATEVIK KHACHATRYAN
Deputy Chairman of the Management Board Evoca Bank

Fab Lab Armenia is deeply grateful for the support and collaboration of key partners, including The Central Bank of Armenia, which has backed the initiative since its inception in 2014. We are equally thrilled to embark on a new chapter with the support of Evocabank, a partner that shares Fab Lab Armenia’s mission and vision for the future.

Our ever-lasting gratitude to The Central Bank of Armenia (CBA) and its Dilijan Training and Research Center spearheaded the establishment of the pioneering Fab Labs in Dilijan and Yerevan with the goal of seeding the new Digital economy.

In 2014, under the visionary leadership of Deputy Governor Dr. Nerses Yeritsyan and in collaboration with Jacqueline Karaaslanian, Co-Founder of Learning Learning Architects, and Dr. Niel Gershenfeld, Head of the MIT Media Lab Center for Bits and Atoms, Armenia witnessed the inauguration of two fab labs. One found its home within the Ayb School in Yerevan, while the other nestled within the Central School of Dilijan.

From 2018 onward, The Central Bank of Armenia, led by Deputy Governors Dr. Nerses Yeritsyan and Dr. Armen Nurbekyan (former Head of the CBA Training and Research Center of Dilijan), supported the enrollment of Fab Lab Dilijan into the esteemed Fab Academy Program, administered by

the MIT Center for Bits and Atoms and its Boston-based Fab Foundation. Over the past two decades, the Fab Academy program has forged a global network of 2,700 Fab Labs across 125 countries, fostering innovation and collaboration. Beyond financing the purchase of the equipment for the two Fab Labs, CBA has been sustaining the operational costs for the Fab Lab Dilijan and providing scholarships for Fab Academy Graduates in Armenia. The CBA has been key in catalyzing the country’s burgeoning digital economy. Since 2020, under the guidance of the new leadership of the Central Bank of Armenia, led by Governor Dr. Martin Galstyan, Fab Lab Dilijan has been priming itself for autonomy and evolving into The Fab Lab Armenia Education Foundation in August 2023.

Thanks to the sustained support of the Central Bank of Armenia, The Fab Lab Armenia Education Foundation has evolved into a dynamic Technology Learning and Training Hub, extending its impact beyond local communities. It now spearheads the establishment of Fab Labs nationwide, empowering individuals and educators with essential digital fabrication skills. Additionally, it fosters a vibrant ecosystem by re-skilling professionals, fostering innovation among startups, and nurturing the entrepreneurial spirit among young talents, thus laying the foundation for a thriving digital manufacturing network.

Our Deep Gratitude to Evocabank. The saying that “Success Rewards The Bold ” comes to mind. Thank you to Evocabank for investing in the Future and empowering Fab Lab Armenia to grow and become a Learning and Training Hub in Digital Fabrication Skills for the Nation, the Region and Worldwide.

Evocabank is at the forefront of Armenia’s digital banking progress and has forged a dynamic alliance with Fab Lab Armenia, marking a pivotal moment in the nation’s journey towards innovation and educational excellence. Officially solidified on November 17 during the Fab Lab Armenia NEXT IS NOW conference, with the esteemed presence of the Minister of Education, this collaboration heralds a significant stride for both organizations.

Deeply felt thanks to Tatevik Khachatryan, Deputy Chairman of Evocabank Management Board, who is also a Board Member of Fab Lab Armenia, Education Foundation and represents the visionary and forward-thinking attitude of the founders and leadership team of Evocabank led by Mareta Gevorkyan, Vazken Gevorkyan and Chairman and CEO Karen Yeghiazarian.

This partnership symbolizes a joint dedication to propelling Armenia’s digital landscape forward. Evocabank empowers the Fab Lab Armenia Education Foundation to expand its

mission ambitiously. This part of the funding is earmarked for establishing a dynamic Technology Learning and Training Hub, catering to individuals and private and public organizations seeking to acquire essential digital fabrication skills. By fostering innovation, nurturing talent, and enhancing the skills of professionals, the initiative aims to foster a vibrant ecosystem for digital manufacturing.

Aligned in this vision, we are embracing a future where technological excellence propels socioeconomic growth and empowers the next generation of innovators and leaders. These sponsorships and partnerships stand as a testament to the commitment to driving enduring change and unlocking boundless possibilities. Fab Lab Armenia renews its thanks to the Central Bank of Armenia and Evocabank for their trust in shaping a positive future together.

Unlimited Gratitude to our Board Members

We extend our gratitude to the Fab Lab Armenia Board Members for their exceptional support, dedication, and vision. Their belief in the Fab Lab Armenia mission and vision, during the challenging times of transition and growth, serves as a lifeline and guiding light that strengthens the team’s resolve, fuels passion, and moves everyone forward. They see beyond today, envisioning a future where creativity, innovation, and collaboration uplift our community and

empower us to create meaningful change.

Your leadership, resilience, and generosity of spirit inspire every one of the Fab Lab Armenia team to persevere, adapt, and strive for excellence. Thank you for standing by our side, through every challenge and triumph, and for being the driving force behind our shared journey toward a better future.

**A Sincere Appreciation for a Supportive Collaboration
MIT Center for Bits and Atoms and Boston Fab Foundation,
Where It All Started!**

We are deeply grateful for the incredible collaboration between Fab Lab Armenia, the MIT Center for Bits and Atoms, and the Boston Fab Foundation. Under the visionary guidance of **Professor Neil Gershenfeld** and the exceptional leadership of **Sherry Lassiter**, we have witnessed the transformation of digital fabrication into a global movement. This network has allowed us to connect Armenia to a world of limitless creativity and innovation. We are thankful for the opportunity to contribute to this powerful vision and to be part of a community that fosters collaboration, learning, and impactful solutions that continue to shape our realities. Together, we welcome the future with confidence and joy in learning, co-creating and sharing.

Grateful To Our Strategic Partnerships

We extend our gratitude to the Government of the Republic of Armenia, with special recognition to **Zhanna Andreasyan**, Minister of Education, Science, Culture, and Sports, as well as Deputy Minister **Araksia Svajyan** and staff members **Suzanna Azatyan** and **Lusine Basentsyan**. We deeply value their

collaboration, support, and tireless dedication to integrating advanced technologies into STEAM education. Together, we design and implement programs to reach out and impact high school and university students and academic staff throughout Armenia.

Katapult/AGBU

We extend our heartfelt gratitude to the leadership of AGBU, particularly **Vasken Yacoubyan**, Central Board Member, Executive **Director Marina Mkhitarian**, and **Anna Gargarian**, Creative Strategist and Lead of the Katapult program. We are also deeply thankful for the dedicated support of the Katapult staff, including **Shoghakat Melke-Galstyan**, who has been instrumental in communications and event coordination, **Narek Tovmasyan**, for his invaluable guidance in advocacy management, and **Marina Oganessova**, for her exceptional coordination of multiple brainstorming and site-working sessions. Through the Katapult program, we have successfully expanded our network of excellence to the city of Gyumri. Our gratitude to Vahagn Ghukasyan and Tatev Hartenyan, and by extension, to the State Academy of Fine Arts Institutes throughout the country.

Living Lab-Paris, France

Fab Lab Armenia extends its sincere gratitude to **Florent Aziosmanoff**, the founder of Living Lab in Paris, France. Aziosmanoff is a renowned futurist and pioneer in the field of living art, as well as an expert in developing innovative curricula for universities and researchers around the world. Fab Lab Armenia is deeply appreciative of Aziosmanoff's invaluable guidance, teaching, and training provided to our staff, as well as our art and engineering collectives in

Armenia. Through his dedicated efforts, Fab Lab Armenia has significantly advanced its capabilities in designing and programming responsive environments, while also building robust expertise in Ambient Intelligence within the country. Aziosmanoff's expertise and mentorship have been instrumental in empowering Fab Lab Armenia to push the boundaries of creativity and technology. This collaboration has enabled our organization to elevate its impact and make meaningful strides in integrating living art and ambient intelligence into our educational initiatives and community programs. We are truly grateful for Aziosmanoff's partnership and the transformative contributions he has made to Fab Lab Armenia's growth and success.

LABSTER

Fab Lab Armenia expresses its sincere gratitude to Labster, a pioneering company transforming science education through the creation of immersive virtual simulations. These cutting-edge simulations have opened new pathways for learners to explore and understand complex scientific concepts in an accessible and engaging manner, making learning truly fun and empowering. Labster's innovative work has enriched classrooms and empowered educators and students alike, both globally and within Armenia. A special thanks go to Malte Staps, Director of Partnerships EMEA at Labster & UbiSim, along with Manny Winkler, Global Customer Success Manager, and their dedicated teams for their unwavering support in making these powerful learning tools available and accessible to the Fab Lab Armenia community. Fab Lab Armenia deeply appreciates Labster's collaborative efforts with our organization and the Ministry of Education to make science education

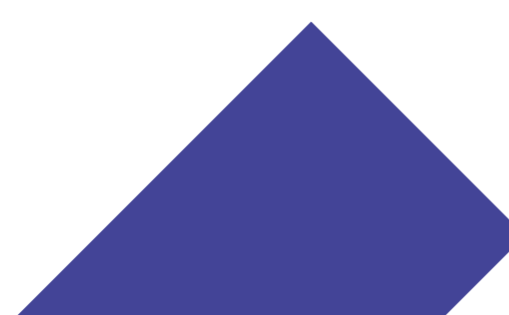
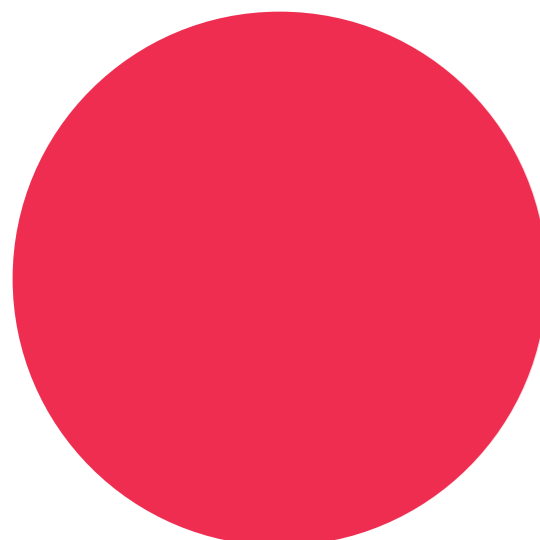
more inclusive, inspiring, and impactful for youth across Armenia. The positive impact of Labster's virtual simulations has been instrumental in fostering a greater interest and understanding of scientific disciplines among the next generation of Armenian learners and innovators.

Communities Local and Global

Sincere gratitude extends to a growing community and partnerships with Schools, Teachers, Students, Parents, and others locally and globally. They are part of a circle of generosity that keeps our world growing and reaching out to more and more people who imagine, design, and implement projects to shape desired futures collectively!

The Dilijan Central School

Thank you especially to the Dilijan Central School Administration, Executive Director **Aram Mehrabyan**, Academic Director **Naira Daluzyan**, Deputy Director **Anahit Apinyan**, Teachers **Ani Bejanyan** and **Syuzanna Martirosyan**, **Lilit Harutyunyan**, **Hasmik Soghomonyan**, **Hovhannes Harutyunyan**, and their Students and Volunteer Parents.



The UWC Dilijan Teachers and Students

All Volunteer Individuals and Professionals from the communities of Dilijan, Ijevan, Vanazor, Gyumri, and Yerevan contributed their time, expertise, and passion for learning and doing.

Fab Lab Armenia's Multidisciplinary Innovators in Residence

Fab Lab Armenia hosts a dynamic community of researchers, programmers, engineers, and artists in residence. These innovators contribute their expertise in machine prototyping, supplementing the lab's existing capabilities with specialized tools and knowledge. Driven by a passion for teaching, they demonstrate how machines can create other machines and much more, preparing the lab to welcome an enhanced "Super Fab Lab" facility. Key figures in this innovative cohort include Onik Babayan, Mkhitar Evoyan, Maxime Richard, and Gevork Yerghyan.

Fab Lab Armenia's Creative Collaborators: Pioneering Artists

Fab Lab Armenia is honored to work alongside a talented group of artists who are embracing digital tools to expand the boundaries of their creative practice. This collaborative journey with these pioneering individuals - including Anna Badalyan, Eliza Baghdiyan, Efi Farnaki, Hereghen Gasparian, Elina Galoyan, Lucine Melke-Galestyan, Meri Martirosyan, Ashot Mikayelyan, Mamikon Mikayelyan, Gayane Unanyan, and Eliza Nersisyan - allows the lab to project into the future, daring to dream differently and explore the vast possibilities unlocked by new digital technologies.

Nurturing the Next Generation at Fab Lab Armenia Kids Club

Fab Lab Armenia's Kids Club serves as a vibrant incubator for young innovators, empowering them to express their full potential. By fostering an environment where youth can pursue their own research goals, make decisions, and drive the implementation and outcomes of their projects, the Kids Club exemplifies the power of "Kid Power." This inspiring cohort includes standout members like Aleqs Aghajanyan, Mkhitar Hovhanissyan, and Armen Melkonyan, who are leading the way in shaping the future of creativity and innovation.

GUEST SCIENTISTS AND SPEAKERS

Brice Ammar Khodja, Researcher at EnsAd Lab for Reflective Interaction research, Paris France

Zhanna Andreassyan, Minister of Education, Science, Culture and Sports

Shahane Halayyan, COAF Education Program Manager

Tatevik Khatchatryan, Evocabank Deputy Chairman of the Management Board

Sarkis Karapetyan, CEO Armath

Lynn Paravyan, Strategy Developer at Katapult and founder and CEO of OWS Think Tank

Malte Staps, Director of Partnerships Labster & UbiSim for Europe, the Middle East and Africa

Vahan Poghosyan, Founder of REAL School

Mher Mehrabyan and Satik Nairyan, Founders of the Aren Mehrabyan Foundation

THE FAB LAB ARMENIA STAFF KEEPS LEARNING AND DOING:

Babken Chugaszyan, CEO

Anoush Arshakyan, Fab Academies Support Instructor and Creative Content Developer and Lead for Fabricademy Programs

Rudolf Igityan, Fab Academies Support Instructor and Lab Engineer / Lead for Open-Source Machine Building Programs

Maxime Richard, Fab Academies Support Instructor and Pedagogical Content Developer, Lead of "Labster" hybrid Education Science Programs and Lead of Fab Learning Academy for Educators

Mkhitar Evoyan, Technical Support Assistant

Syuzanna Martirosyan, STEAM Education Program Assistant

Tatevik Sahakyan, Legal Officer

Sona Markosyan, Accounting Officer

Expressing Gratitude for Exceptional Partnerships with Learning Learning Architects

Fab Lab Armenia extends its heartfelt gratitude to the exceptional partners who have provided invaluable support to the organization across a wide range of disciplines. Among these distinguished collaborators is Brand Real @ Learning Learning Architects, LLC, a solution-design agency based in Boston and Yerevan with a global team working on five continents.

This partnership has empowered Fab Lab Armenia to amplify its impact and reach through the expertise of Learning Learning Architects, led by Co-Founder and President Vazken Kalayjian, and his experienced team of professionals. The creative team at Learning Learning Architects is known for their impressive track records in innovation, specializing in building prototypes that encompass the full potential and promise of their clients' visions. This team, including Maria Lucas, Tiziano Bollettini, Mariella Liberati, Paul Richards, Emily Shore, and Joel Stevens, have contributed strategic insights and hands-on support in shaping Fab Lab Armenia's narrative, visual identity, and stakeholder engagement.

Representing diverse backgrounds, cultures, generations, and strengths, the Learning Learning Architects team is united in their values and goal of shaping better futures. Drawing on their experience working in innovative hubs like MIT Media Lab, Harvard, Pratt, NYU, and Digital Art Centers in France, this team has expanded its collaboration into vast networks to provide Fab Lab Armenia with the expertise and resources needed to turn its ideas and visions into transformative products, services, and projects.

This collaborative effort has been instrumental in elevating Fab Lab Armenia's profile, fostering deeper connections with its community, and advancing its mission to drive innovation and creativity in education. By leveraging the expertise and flexible strategies of Learning Learning Architects, Fab Lab Armenia is empowered to bring its dreams to life and transform communities, society, and the world.



↑ Heartfelt gratitude for your continued support. Please donate generously by clicking this DONATE link: fablabarmenia.com/donate



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Annual Report 2023

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