
TechCamp
Brasil
STEAM
innovation in education
full report 2020

TechCamp Brasil

STEAM

innovation in education

Organizers

Support

Major Sponsor

As we conclude the third STEAM TechCamp, implemented in partnership with the University of São Paulo (USP), and which counts on the support from Brazil's branch of U.S. company 3M and the National Council of State Secretaries of Education (CONSED), we could not be happier with the overall results of this program. This week-long STEAM education immersion targets secondary public school curriculum coordinators and teachers from across Brazil for presentations, workshops, and hands-on activities with the objective of exposing them to innovative teaching methodologies, digital tools, and help them in the development of measurable action plans that address key high school STEAM deficit areas and provide better workforce readiness for Brazilian youth.

Over the course of three years, STEAM TechCamp has stimulated the creation of a strong network of education changemakers by directly benefiting 179 educators from all 26 Brazilian states and the Federal District who, in turn, have developed training opportunities and follow-on initiatives that have, so far, impacted more than 33,503 teachers and 140,052 students.

In a time when the world is facing unprecedented challenges, the U.S. Embassy and Consulates in Brazil believe that by investing in engaged educators we will be helping them empower and develop a 21st-century workforce that will be able to think creatively in scalable solutions that address real problems.

Todd Miyahira

Attaché for Education and Cultural Affairs at the U.S. Embassy in Brazil

The University of São Paulo and the Polytechnic School thank the United States Diplomatic Mission in Brazil for the partnership in the successful STEAM TechCamp Brasil Program.

The program started in 2018 as an initiative of the U.S. Embassy in Brazil in partnership with the Technological Integrated Systems Laboratory (LSI-TEC), scientific support and coordination from the University of São Paulo Polytechnic School (POLI-USP) and the collaboration of other entities in each edition. Since the 2020 edition, the program has been called STEAM TechCamp Brasil, adding the letter "A" for Arts in its broadest dimension.

The STEAM TechCamp Brasil program conducts training and disseminates planning strategies to incorporate innovative methodologies and practices into education, in which Science, Technology, Engineering, Arts and Mathematics are addressed in an integrated and active way, employing interdisciplinary approaches and exploring real-world issues and problems with the support of digital tools.

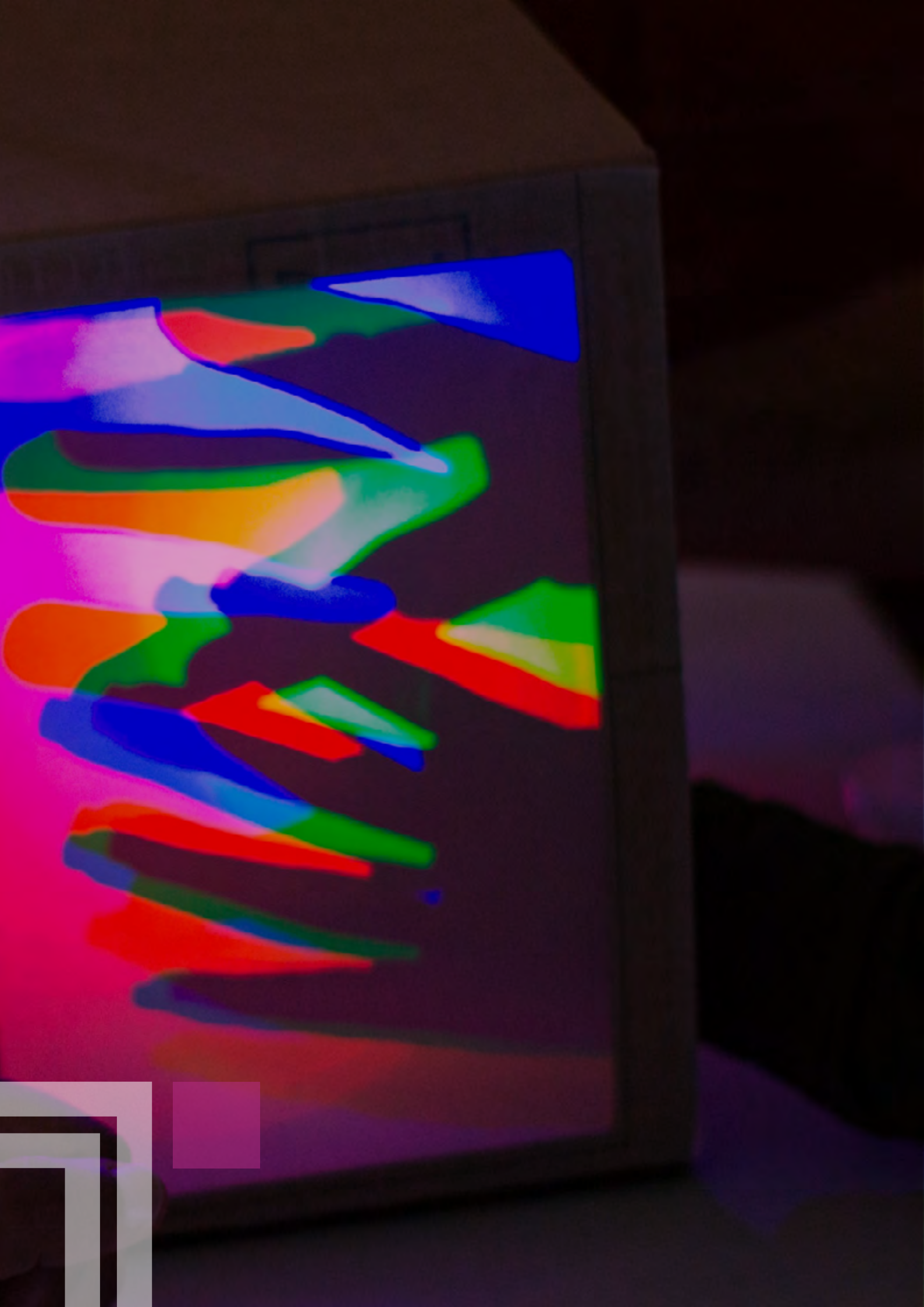
The participants of the three editions constitute a network of innovative managers and teachers from all Brazilian states, able to articulate and improve existing programs and develop and implement new actions aimed at STEAM learning in the Brazilian public school system.

The vast and complex challenges of the contemporary world make this type of initiative even more relevant in Brazil and worldwide. We need citizens prepared and able to make decisions based on scientific evidence, who think and act dynamically and creatively and can find solutions, considering and respecting the various areas of knowledge. Thus, it is up to us to strengthen and expand the STEAM TechCamp Brasil network with awareness-raising and continuous education actions associated with the promotion and monitoring of pilot projects so that the positive impacts of this program can rapidly reach schools throughout the country.

Roseli de Deus Lopes

Scientific Coordinator of the STEAM TechCamp Brasil Program

Associate Professor III at the Polytechnic School of the University of São Paulo



summary


Baixo desempenho escolar
Espaço da tecnologia na sociedade
Ativo/ desafiante
Currículo Contempo-râneo
Contextua-lizado /real

introduction

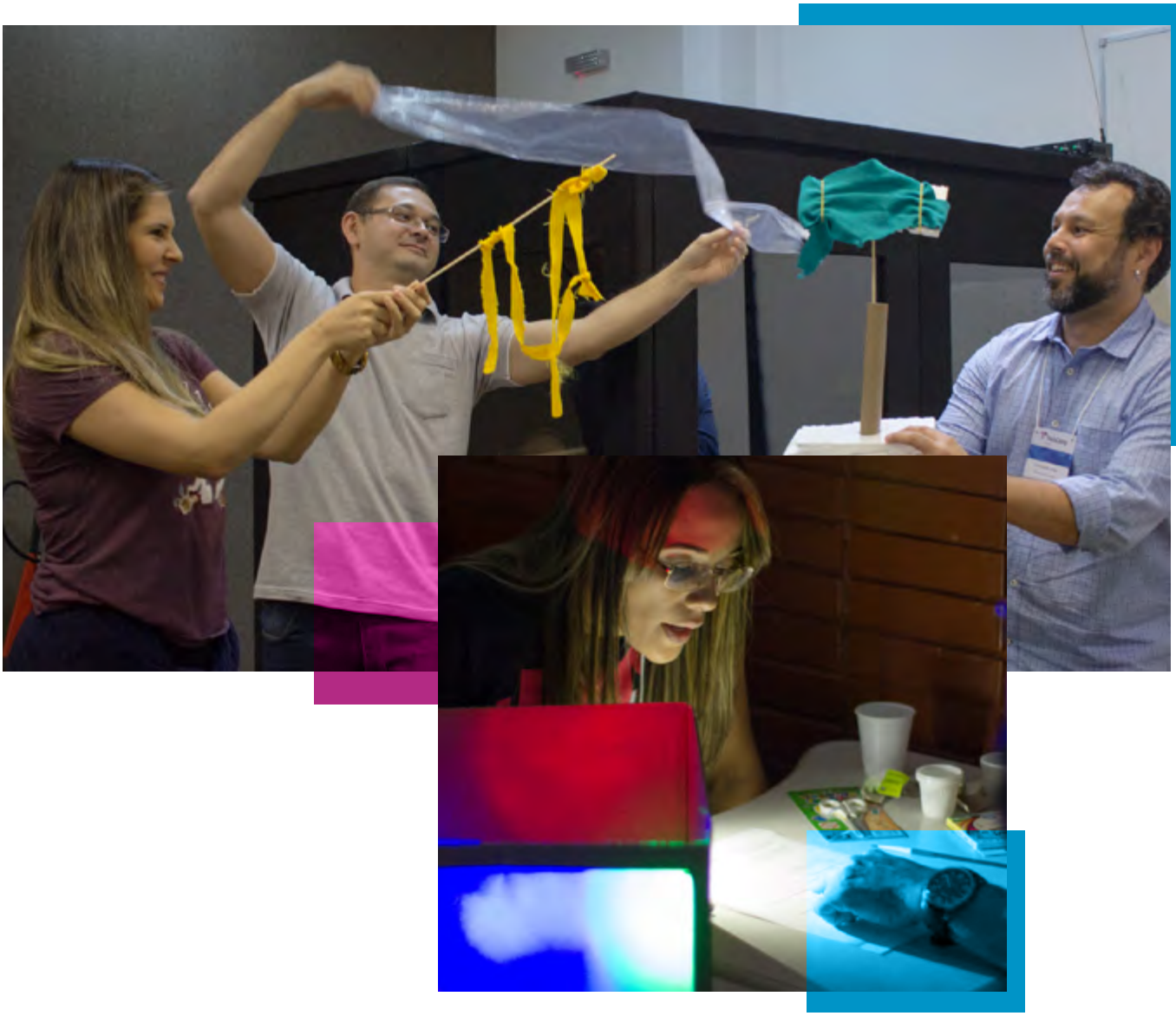
introduction

The acronym STEAM stands for Science, Technology, Engineering, Arts and Mathematics. Through the integration of knowledge in these five fields of study, STEAM can be employed as a teaching and learning methodology that endows students with the ability to overcome everyday problems and future challenges.

The emergence of STEAM as an educational approach directly results from increased Internet access and emerging technologies. Indeed, our world has changed a lot over the past couple of decades, and we must begin to think outside of the box and not in a narrow, isolated way. We must also be aware that society, in general, is dynamic and complex, changing and evolving every day. In many ways, the problems, paths, and solutions that our society faces are interconnected. Technology provides us with the tools and means to respond to an environment constantly being created and altered.

Thanks to technology and knowledge, we now find ourselves at a point where it is not only possible but necessary that we make every effort to create learning environments that are integrated, fluid, dynamic and relevant, ones that provide all of the necessary tools to train our teachers and teach our students to be active participants in research and innovation.

According to Roseli de Deus Lopes, professor at the Polytechnic School at the University of São Paulo and scientific coordinator of the STEAM TechCamp Brasil, we must encourage initiatives that allow “teachers and managers from the Brazilian education network to share

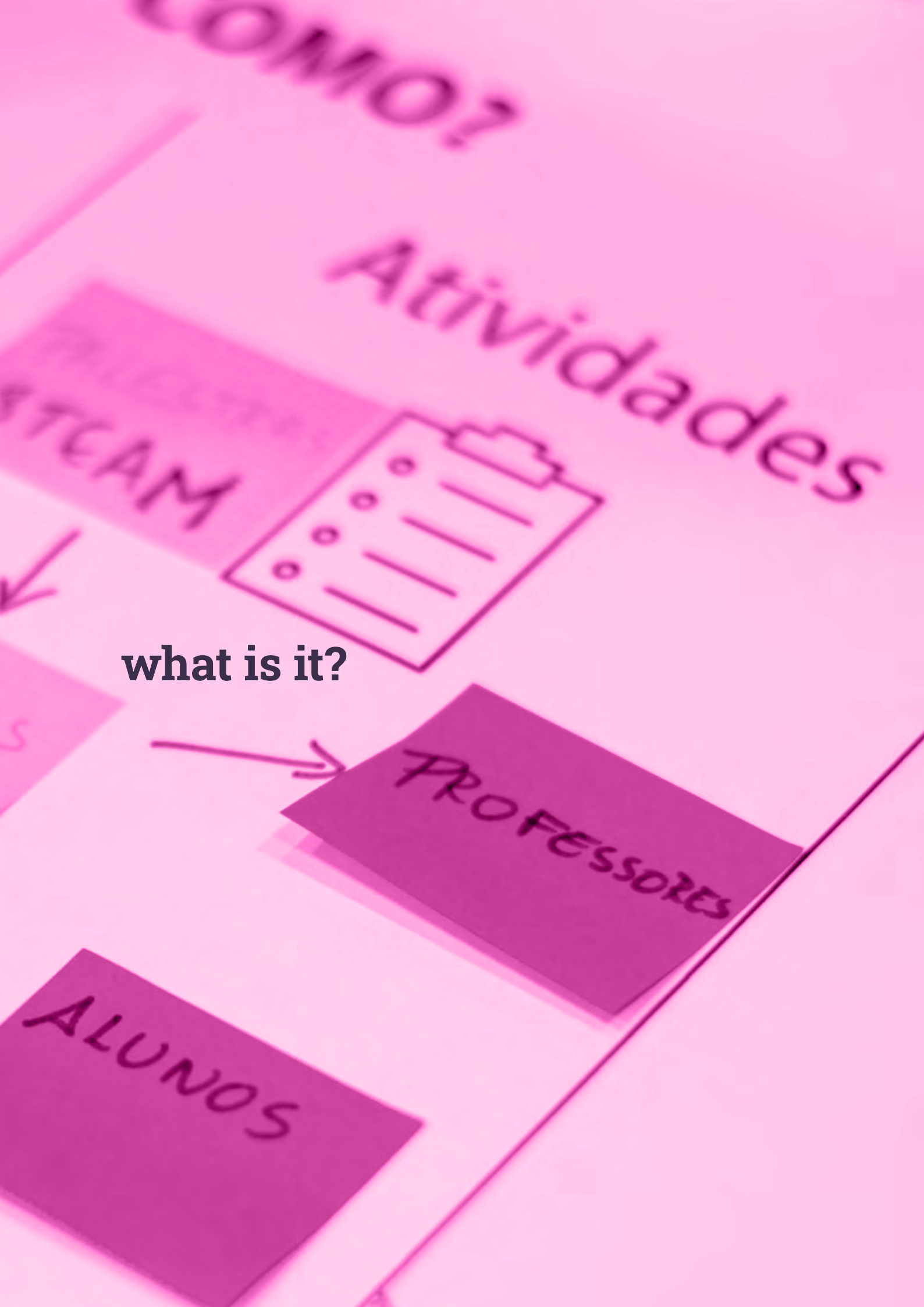


their experiences on how to integrate Science, Technology, Engineering, Arts and Mathematics into the schools, using activities that are linked to the real world, so that we can achieve a better engagement from students based on their various interests". Every day young people are inserted into real-life situations that involve all fields of study, and, most of the time, they do not even notice it. Consequently, they must begin to understand that there is a reason for everything they experience.

Currently, there is an urgent need for citizens with a different mindset, people who think and act dynamically, identifying creative solutions through the integration of various fields of study. This necessity becomes more urgent each day, and we must stimulate these thought processes and behaviors in schools worldwide. However, we need to start by training the teachers about selecting and utilizing the right tools for attaining this goal with their students.

The STEAM teaching methodology is exciting, fun, provocative and challenging and, through the results achieved over these three years of STEAM TechCamp, we have already observed that this methodology stimulates both teachers and students to take risks responsibly, to participate in teaching and learning without borders and to embrace problem-solving approaches with a sense of collaboration, integration and creativity. These are the learners, educators, citizens and leaders needed to build our future!


OFICINA
STEAM
AÇÕES



what is it?

what is it?

> STEAM is our connection with the future of Brazil.
>
> Michael McKinley, Ambassador of the United States of America, STEAM TechCamp 2018

TechCamp is a program hosted by the U.S. Department of State that connects specialists in technology with journalists, educators and representatives of NGOs and public organizations. Its primary goal is to encourage them to explore innovative technological solutions to problems (https://techcamp.america.gov). Since its creation in 2010, the program has conducted more than 40 TechCamps and trained more than 2,100 participants from over 110 countries.

In 2018, the U.S. Embassy in Brazil brought TechCamp to Brazil to conduct an immersion program in the STEAM field with Brazilian educators. The program is an initiative of the U.S. Embassy in Brazil in partnership with the Technological Integrated Systems Laboratory (LSI-TEC) and support from the Polytechnic School of the University of São Paulo (POLI-USP).

The U.S. Embassy's Public Affairs Counselor, Erik Holm-Olsen, stated that the program is "one way that we are engaging educators from all of Brazil, trying to inspire them and provide them with a network to share best practices and information to take to their classroom, particularly as Brazil is engaging in reforms in its public school system that is really allowing greater innovation and creativity in these areas".

The program's primary goal is to directly connect technology and education specialists from all over the world with managers from the State Secretariats of Education and K-12 teachers in Brazil. These interactions allow these professionals to share and expand the knowledge about the different teaching tools, practices and strategies that can help them overcome the challenges they face in their teaching duties. During these three editions, TechCamp Brazil has already created a network of multipliers with potential and leadership that articulate and improve existing action plans and develop and implement new ones, employing the active learning STEAM approach in Brazil's public school system.

MAIN GOALS

CONNECT STEAM specialists with Brazilian education professionals.

Structure a network of multipliers of the **STEAM** methodology.

Implement actions for the **ACTIVE LEARNING** of **STEAM** in Brazilian K-12 education.

ENCOURAGE the planning of science, technology and engineering fairs in Brazil to **DEVELOP DIGITAL EDUCATION**, critical thinking and research in K-12 education.

Overcome the **CHALLENGES** of teaching.

Train citizens to think in an **INTEGRATED AND INNOVATIVE** manner.

Like the two previous editions, the third edition of the STEAM TechCamp Brasil was a success. More than 45 specialists and researchers, 179 teachers and education managers have participated in the three editions, which included 108 hours of training activities.

The third edition took place from January to December 2020, offering both online and face-to-face activities. Examples included lectures by educational and entrepreneurship leaders, group discussions, collective and dynamic constructions using Design Thinking techniques, development of the first version of the strategic planning proposals for implementation in school communities and more.

participants

participants

> This initiative allows teachers and managers to share their experiences on how to integrate STEAM into the schools, using activities that are linked to the real world.
>
> Roseli de Deus Lopes, STEAM TechCamp Brasil Scientific Coordinator, STEAM TechCamp 2020

To participate in the program, K-12 education professionals from all over Brazil registered and submitted letters highlighting their previous active learning STEAM experiences in the teaching and/or managing academic programs.

Among the many great submissions for the 2020 edition, the STEAM TechCamp Brasil Selection Committee, composed of professors and researchers from USP, professionals from LSI-TEC and the U.S. Embassy in Brazil, worked hard to select the best candidates. The committee sought to choose individuals who were excited and interested throughout the entire process, could integrate and participate in all activities and brought an enriching cultural and educational background.

Participants in the 2020 edition of the STEAM TechCamp Brasil were entitled to:

- Participate in all online and face-to-face activities offered by the STEAM TechCamp Brasil Program.
- Participate, with all airfare and accommodation costs covered by the Program, in the STEAM TechCamp Brasil Workshop Week at USP, in São Paulo.
- Receive a certificate of participation at the end of the edition.
- Access the communication platform of the STEAM TechCamp Brasil Network to exchange experiences between participants, specialists and professionals from the US Embassy, LSI-TEC and POLI-USP.
- Receive support during the Workshop Week and through interactions in the STEAM TechCamp Brasil Network Platform to plan, develop, implement and evaluate strategies and actions aimed at active STEAM learning in public education networks.
- Compete to be part of the official Brazilian party that attends the International Science and Engineering Fair (ISEF), with all registration, airfare, accommodation and training costs covered by the Program.
- Participate, as an Alumni member, in the STEAM TechCamp Brasil network, receiving communication and opportunities from the U.S. Embassy.

2020 WORKSHOP WEEK PARTICIPANTS

SUBMISSIONS

520

submissions

432 teachers

88 managers from Secretariats of Education

SELECTED

58

managers from Secretariats of Education and teachers selected

58
EDUCATORS SELECTED

GENDER

62% men

38% women

CATEGORY

43% public school teachers

47% managers from Secretariats of Education

10% teachers from federal institutes

27 FEDERAL UNITS REPRESENTED
47 CITIES

2020 PARTICIPANTS

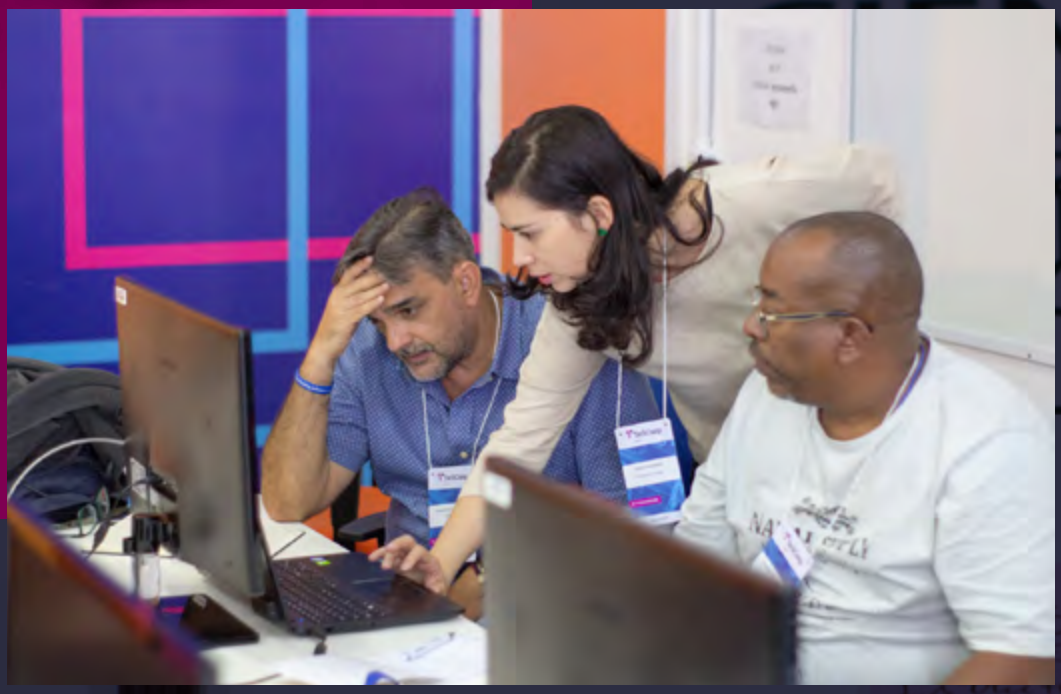
MANAGERS FROM SECRETARIATS OF EDUCATION	
Raquele Alves Nasserala Figueiredo	Rio Branco (AC)
Fabiana Alves de Melo Dias	Maceió (AL)
Jéssica Querolin Góes da Silva	Novo Aripuanã (AM)
Arnanda de Cássia de Oliveira da Silva	Macapé (AP)
Geisa Santos da Silva	Salvador (BA)
Ronaldo Glauber Maia de Oliveira	Fortaleza (CE)
Juliane Amorim Oliveira	Brasília (DF)
Marcio Peters	Serra (ES)
Wagner Alceu Dias	Goiânia (GO)
Maria do Perpétuo Socorro Fortes Braga e Silva	São Luís (MA)
Weynner Lopes Rodrigues	Belo Horizonte (MG)
Valeria Cristina Ferreira da Silva	Campo Grande (MS)
Waleska Gonçalves de Lima	Cuiabá (MT)
Raimundo Argemiro Ataide Neto	Belém (PA)
Greyce Michelinne Rocha Martins	João Pessoa (PB)
José Altenis dos Santos	Recife (PE)
Alexandro de Sousa Sá	Teresina (PI)
Marlon de Campos Mateus	Curitiba (PR)
Pedro de Moraes Rocha	Rio de Janeiro (RJ)
Ciáxares Magalhães Carvalho	Parnamirim (RN)
Deise Silva Lima	Porto Velho (RO)
Gisele Guimarães de Oliveira	Boa Vista (RR)
Simone Machado Poglia Nunes	Pelotas (RS)
Valmir José Turcatto	Curitibanos (SC)
Cecilia Maria Aguiar Guimarães	Aracaju (SE)
Jefferson Heleno Tsuchiya	São Paulo (SP)
Leandro de Souza Vieira	Palmas (TO)

SECONDARY LEVEL TEACHERS FROM STATE PUBLIC SCHOOLS	
Hélio Evangelista da Silva Centro de Matemática, Ciências e Filosofia do Acre	Rio Branco (AC)
Urandy Carlos Marinho dos Santos Centro Estadual Cyro Accioly	Maceió (AL)
Galileu da Silva Pires Escola Estadual Nossa Senhora de Nazar	Manacapuru (AM)
Dayse Maria Queiroz Nascimento Centro de Atividades de Altas Habilidades/Superdotação	Macapá (AP)
André Carlos Pereira da Silva Centro Juvenil de Ciência e Cultura - CJCC Jequié	Jequié (BA)
Graciliano da Silveira Batista Escola de Ensino Médio Governador Adauto Bezerra	Fortaleza (CE)
Edileusa Costa Silva de Carvalho Centro de Ensino Médio Integrado do Gama	Gama - DF
Wanderson de Paula Pinto Escola Estadual de Ensino Fundamental e Médio Frederico Pretti	Santa Teresa (ES)
Francisco Wagner Silva de Sousa Colégio Estadual Rocha Leal	Ceilândia (GO)
Carmem Edime Silva Barroso Centro de Ensino de Tempo Integral Poeta Antônio José	Santa Inês (MA)
Vinicius George dos Santos Escola Estadual Professor Guerino Casassanta	Ribeirão das Neves (MG)
Frederico Pecorelli de Oliveira Escola Estadual Irene Gomes de Campos	Várzea Grande (MT)
Jó Elder Vasconcelos Escola Estadual de Ensino Fundamental e Médio Professora Benvinda de Araújo Pontes	Abaetetuba (PA)
Rodrigo de Almeida Guedes Escola Cidadã Integral Técnica Estadual Luiz Gonzaga Burity Rio Tinto Paraíba	Rio Tinto e João Pessoa (PB)
Leonardo Cordeiro de Araújo Escola Técnica Estadual José Humberto de Moura Cavalcanti	Jaboatão dos Guararapes (PE)
Carla Silva dos Santos CETI José Pereira da Silva	Teresina (PI)
Joaquim Lopes Pereira Colégio Estadual Prefeito Francisco Fontes Torres	Volta Redonda (RJ)
José Everton Pinheiro Monteiro Escola Estadual de Tempo Integral 11 de Agosto	Umarizal (RN)

Jociel Antonio Gonçalves Escola Estadual de Ensino Fundamental e Médio Artur da Costa e Silva	Alto Alegre dos Parecis (RO)
Manoel Reildo Cerdeira dos Santos Escola Estadual de Ensino Médio Major Alcides Rodrigues dos Santos	Boa Vista (RR)
Wagner Mendonça Camargo Escola Estadual de Educação Básica Santa Rita	Gravataí (RS)
Amélia Aparecida Pereira Piola Escola de Educação Básica Casimiro de Abreu	Curitibanos (SC)
Edigenia Ferreira Santos Colégio Estadual Presidente Juscelino Kubitschek	Aracaju (SE)
Alberto Alves Marques Escola Estadual Professora Leila Mara Avelino	Hortolândia (SP)
Larissa Cardoso Beltrão Escola Estadual Girassol de Tempo Integral Agrícola David Aires França	Campos Belos (TO)

SECONDARY LEVEL TEACHERS FROM FEDERAL INSTITUTES

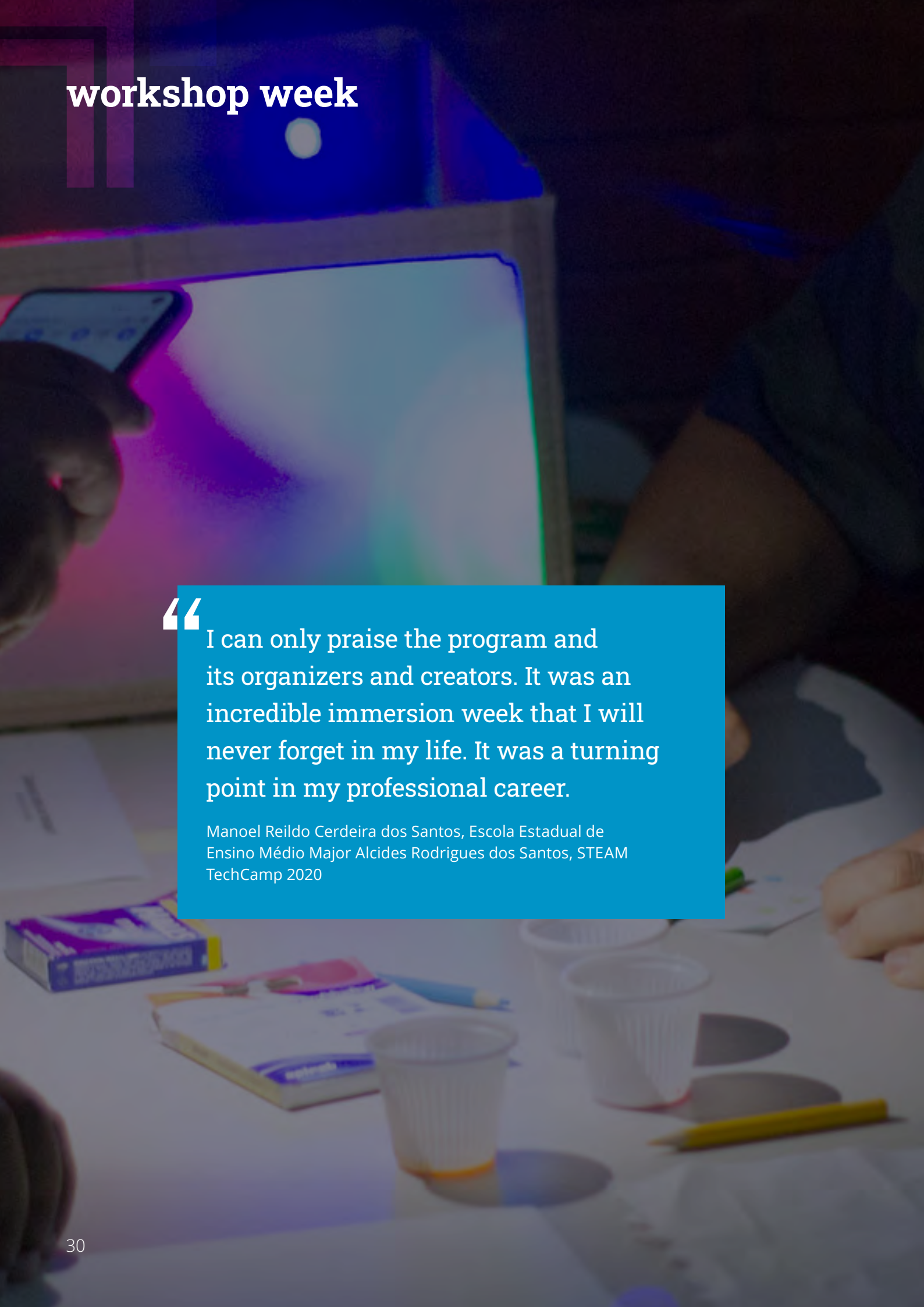
Kleber da Luz Bastos Instituto Federal de Educação Ciência e Tecnologia do Estado do Amazonas - Campus Manaus Centro	Manaus (AM)
Ana Maria Libório de Oliveira Instituto Federal de Brasília - Campus Estrutural	Brasília (DF)
Enderson Neves Cruz CEFET - MG	Belo Horizonte (MG)
Marcos Aurelio Pchek Laureano Instituto Federal do Paraná - Campus Curitiba	Pinhais (PR)
Adel Rayol de Oliveira Silva Instituto Federal de Rondônia - Campus São Miguel do Oeste	Porto Velho (RO)
Diego Marlon de Castro Instituto Federal de Santa Catarina	São Miguel do Oeste (SC)




ARDUINO
UNO

workshop week

workshop week



> I can only praise the program and its organizers and creators. It was an incredible immersion week that I will never forget in my life. It was a turning point in my professional career.
>
> Manoel Reildo Cerdeira dos Santos, Escola Estadual de Ensino Médio Major Alcides Rodrigues dos Santos, STEAM TechCamp 2020

In 2020, the STEAM TechCamp Brasil workshop week was held at the Polytechnic School at the University of São Paulo (Poli-USP) in São Paulo. The program covered all the airfare, accommodation and training activity costs for participants from all the states of Brazil.

The events during the Workshop Week for the education managers and participating teachers were led by specialists from Brazil and abroad. The specialists used investigative and interdisciplinary approaches with various dynamic activities to educate the teachers about scientific and technological research initiation and entrepreneurship. They also gave lectures and held discussions to stimulate and develop the participants' knowledge of the STEAM principles, including the necessary creative culture and active learning environment.

STEAM TechCamp Brasil Workshop Week

2020

FEBRUARY 10 - 14

58 Secretariats of Education managers and teachers

15 researchers and specialists

36 hours of training

SCHEDULE

U.S. Embassy participation	**Erik Holm-Olsen** Public Affairs Counselor of the U.S. Embassy in Brazil
Workshops with educational and entrepreneurial leaders and collective and dynamic constructions	**Leandro Biazon** Researcher & Engineer at LSI-TEC **Cassia Fernandez** Researcher at USP and Stanford FabLearn Fellow **Gustavo Pugliese** Pedagogical Consultant at Foreducation EdTech **Soraya Lacerda** Coordinator at Casa Thomas Jefferson - Makerspace **Daniela Lyra** Educational and Instructional Technology Specialist - Casa Thomas Jefferson **Cris Elder** Associate Professor - University of New Mexico **Amy Homma** Director of Education and Public Engagement - Academy Museum of Motion Pictures

SCHEDULE

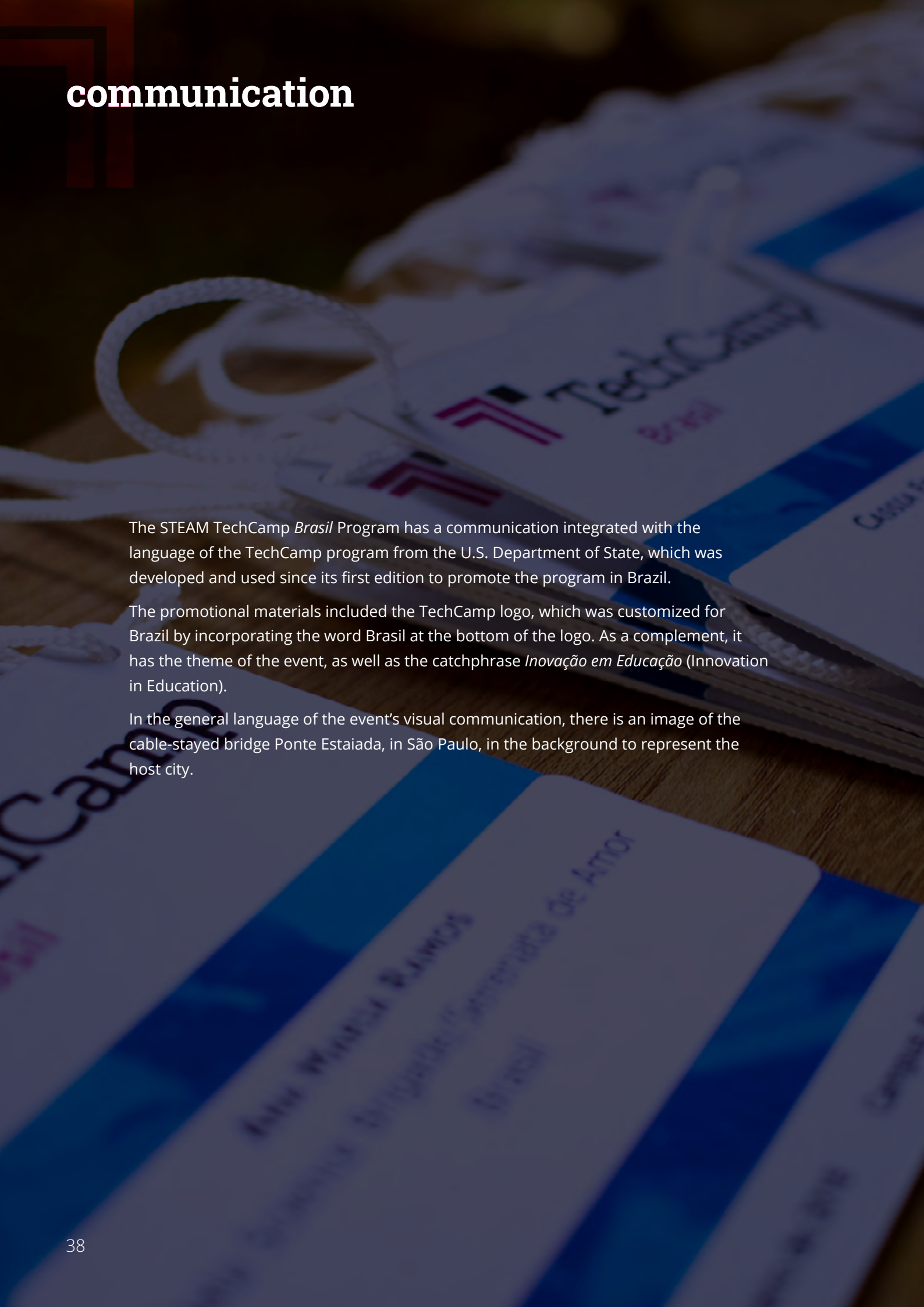
Construction of action plans using Design Thinking techniques to be implemented in their schools' communities	**Roseli de Deus Lopes** STEAM TechCamp Brasil Scientific Coordinator **Irene Ficheman** Education Technology Manager at LSI-TEC **Elena Saggio** Communication Manager at LSI-TEC
Talks and group discussions	**Roseli de Deus Lopes** STEAM TechCamp Brasil Scientific Coordinator **Jennifer Uhler** Regional English Language Officer at U.S. Department of State **Cris Elder** Associate Professor - University of New Mexico **Paulo Gandolfi** R&D Operations Leader at 3M do Brasil **Cristina Sleiman** Partner at PeckSleiman ED **Lisbeth Kaiserlian Cordani** Retired Professor - Institute of Mathematics and Statistics of USP **Amy Homma** Director of Education and Public Engagement - Academy Museum of Motion Pictures


Educação STEAM para o
desenvolvimento de uma pedagogia do
século XX


TechCamp


communication

communication



The STEAM TechCamp *Brasil* Program has a communication integrated with the language of the TechCamp program from the U.S. Department of State, which was developed and used since its first edition to promote the program in Brazil.

The promotional materials included the TechCamp logo, which was customized for Brazil by incorporating the word Brasil at the bottom of the logo. As a complement, it has the theme of the event, as well as the catchphrase *Inovação em Educação* (Innovation in Education).

In the general language of the event's visual communication, there is an image of the cable-stayed bridge Ponte Estaiada, in São Paulo, in the background to represent the host city.

FACEBOOK CLOSED GROUP

To facilitate communication among all STEAM TechCamp Brasil participants, a closed Facebook group was created and has been maintained since the first edition. Group members can exchange information and discuss STEAM education initiatives and practices.

We choose the Facebook platform because of its easy access and due to the fact that Brazil is third in the world for the number of active accounts. Moreover, transferring texts, videos, photos and documents can be easily done through Facebook.

Participation in this group is restricted, and those who are interested must send an authorization request to the group manager. Currently, the group has 266 members, and most are the specialists who attended the Workshop Week and members of the organizing and supporting institutions. Additionally, the Facebook group has 281 publications, 232 comments and 3,336 reactions to initiatives started by its members.

PROMOTIONAL MATERIAL

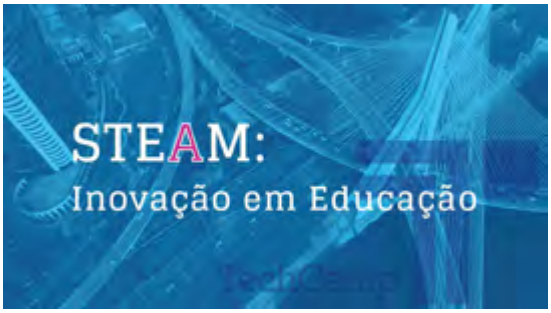
Posts and Header for Instagram and Facebook

E-mail marketing

PHOTO AND VIDEO RECORD

STEAM TechCamp Brasil workshop week in 2020 had its full coverage recorded in photos, which can be viewed in the link below:

The Workshop Week activities, including reports, best moments and interviews with participants, specialists and representatives of the organizing institutions, were video-recorded. Click on the links below to watch them:



STEAM TechCamp Brasil 2020

https://youtu.be/3bNGq2MdNRY

STEAM TechCamp Brasil 2020 - Managers and Teachers

https://youtu.be/zveJNmAzeZY

STEAM TechCamp Brasil 2020 - Trainers

https://youtu.be/6OSj9Sgq9d8

MEDIA COVERAGE

The activities of the 2020 edition of STEAM TechCamp Brasil were disseminated by media coverage in articles about the program that appeared in print and on online media outlets from different regions of Brazil. In total, the 2020 event was mentioned 14 times in various news outlets.

14
mentions on media in 2020

MEDIA COVERAGE IN 2020

Consed portal

http://www.consed.org.br/central-de-conteudos/seduc-tem-projeto-selecionado-pelo-steam-techcamp-brasil-2020

+Unidos

https://maisunidos.org/stem-techcamp-brasil-debate-mecanismos-para-atualizar-ensino-publico-no-pais/

Paraíba State Government

https://paraiba.pb.gov.br/noticias/professor-da-rede-estadual-tem-projeto-selecionado-no-steam-techcamp-brasil-2020

PBVale

https://pbvale.com.br/vale-do-mamanguape/professor-da-ecit-burity-tem-projeto-selecionado-no-stem-techcamp-brasil-2020/

IFSP Portal

https://www.ifsp.edu.br/ex-alunos/17-ultimas-noticias/1274-professor-e-alunos-do-ifsp-participam-da-steam-techcamp-brasil

Roraima State Government

http://www.rr.gov.br/index.php/component/k2/item/1150-stem-tecnica-da-seed-e-professor-participarao-de-programa-da-embaixada-dos-eua-no-brasil

IFRS Portal

https://ifrs.edu.br/programa-para-estimulo-de-stem-recebe-inscricoes/

Espaço Livre Notícias

http://espacolivrenoticias.com.br/professora-de-rede-estadual-e-selecionada-para-multiplicar-curso-da-embaixada-dos-eua/

SEED-SE

https://www.seed.se.gov.br/portaldoprofessor/noticia.asp?cdnoticia=15350

A União PB

https://auniao.pb.gov.br/noticias/caderno_paraiba/professor-da-rede-estadual-tem-projeto-selecionado-no-steam-techcamp-brasil-2020

SEE-AL

http://educacao.al.gov.br/noticia/item/17215-educadores-da-rede-estadual-participam-do-encontro-steam-tech-camp-brasil-2020-na-usp

SEDUC-MT

http://www.mt.gov.br/web/seduc/-/15820013-mostra-cientifica-virtual-segue-com-inscricoes-abertas-ate-a-proxima-sexta-feira-13-

SEDUC-MT

http://oprogressonet.com/regional/professor-de-centro-educa-mais-e-selecionado-pela-embaixada-americana-para-formacao-cientifica/88944.html

CTI

https://www1.cti.gov.br/pt-br/noticias/professor-do-ifspcampinas-participa-do-programa-stem-techcamp-brasil


TechCamp
Brasil

ISEF participation

ISEF participation

> Students and TechCampers participating at ISEF contribute to expanding the reach of STEAM activities in Brazil. The support of the U.S. Embassy is critical in this process.
>
> Irene Karaguilla Ficheman, Education Technology Manager at LSI-TEC, STEAM TechCamp 2020 trainer

As part of the STEAM TechCamp Brasil program, the U.S. Embassy in Brazil, in partnership with the Technological Integrated Systems Laboratory (LSI-TEC), selected the best participants of the program in 2020 to join the official Brazilian party of educators and young scientists to attend the ISEF (International Science and Engineering Fair), to which FEBRACE is affiliated.

The ISEF is a Society for Science & the Public (SSP) program and the world's largest international pre-college science competition. Each year, approximately 1,800 secondary level students from more than 80 countries are awarded the opportunity to showcase their independent research and compete for almost US$4 million in prizes. The ISEF is a unique opportunity that allows the participants to interact with students and mentors from around the world, understanding the application and effectiveness of STEAM programs in other locations.

In the previous two editions of this program, the U.S. Embassy and Consulates in Brazil supported the STEAM TechCamp Brasil participants selected to participate in the ISEF, as well as students selected at FEBRACE, by covering all their registration, airfare, ground transportation, accommodation, meal and training activity costs. However, due to covid-19 pandemic-related restrictions during the third edition, the ISEF took place online, utilizing virtual rooms for each project category and contained videos about the finalists' projects. Thus, only the registration fee expenses were covered in 2020.

ISEF 2020

May 18-22, 2020

ISEF 2020 took place online on the website:

https://www.societyforscience.org/isef/2020-2/virtual-regeneron-isef-2020

9 PROJECTS selected to join the Brazilian party at ISEF 2020:

Project	Members	City/State
Friday: uma prótese microcontrolada	Thiago Costa Moreira (Student) Fabiana da Silva Maia (Teacher)	Tabuleiro do Norte (CE)
Polibrick: espuma rígida de poliuretano como agregada em blocos de concreto	Eduarda Lazzeri Goldani (Student) Lucinara de Souza Linck (Teacher)	Novo Hamburgo (RS)
Produção de biomembranas e formulações farmacêuticas a partir do látex da mangaba (Hancornia speciosa) para auxílio na cicatrização de úlceras de perna em portadores do diabetes mellitus	João Pedro De Oliveira Lima (Student) Ítila Maykely Santos Conceição (Student) Saulo Luis Capim (Teacher)	Catu (BA)
Crise dos antibióticos: bacteriocinas do soro de leite de vaca fermentado por grãos de kefir. Uma possível solução?	Samara Rossi de Barros Almeida (Student) Sophia Rossi de Barros Almeida (Student) Maria Raquel Manhani (Teacher)	Suzano (SP)
Efeito fungitóxico de extratos vegetais sobre o desenvolvimento in vitro do fitopatógeno Colletotrichum gloeosporioides (Penz.) causador da antracnose em mamoeiros	Augusto Cesar Catuzzo (Student) Dionéia Schauren (Teacher)	Toledo (PR)
Criptografia pós-quântica	Henrique Vieira dos Santos Guerra (Student) Cristiane Rodrigues Caetano Tavolar (Teacher)	São Paulo (SP)
Educação de imigrantes haitianos no Brasil: mapeamento das condições de escolarização de haitianos na educação básica brasileira por meio de indicadores educacionais - Fase II	Ana Ferreira Meletti (Student) Silvia Márcia Ferreira Meletti (Teacher)	Londrina (PR)
TAAPETE: tecnologia assistiva acessível para pessoas com tetraplegia	Álvaro da Silva Couto Vasques (Student) Leandro Silva Teixeira (Teacher)	Valença (BA)
TaipaEstock - armazenamento de grãos utilizando taipa de mão	Gustavo Kloch Neideck (Student) Karla Funfgelt (Teacher)	Rio do Sul (SC)

small grants

small grants

During the 2020 edition of the STEAM TechCamp Brasil, the participants had the opportunity to transform their proposed initiatives developed during the Workshop Week into concrete proposals that could be subsequently implemented in their school activities. The projects needed to demonstrate innovation in the active learning of STEAM, disseminate digital skills and expand collaboration among different schools and municipalities.

These projects were submitted to Small Grants offered by STEAM TechCamp Brasil. They were then evaluated by a technical-scientific committee composed of representatives from the U.S. Embassy in Brazil, the University of São Paulo and LSI-TEC. The best proposals were selected and received financial support to initiate the projects in their communities.

12
PROPOSALS SELECTED

12
states benefited

$ 22,682.00 (USD)
amount distributed by Small Grants

83,062
students and teachers reached

$ 1.42 (USD)
amount by reached person

PROPOSALS SELECTED IN 2020 TO RECEIVE THE AMOUNT OF 2,062 DOLLARS PER PROJECT

Leader	Co-leader	State
Hélio Evangelista da Silva	Raquele Alves Nasserala Figueiredo	AC
Fabiana Alves de Melo Dias	Urandy Carlos Marinho dos Santos	AL
Dayse Maria Queiroz Nascimento	Arnanda de Cássia de Oliveira da Silva	AP
Geisa Santos da Silva	André Carlos Pereira da Silva	BA
Maria do Perpétuo Socorro Fortes Braga e Silva	Carmem Edime Silva Barroso	MA
Waleska Gonçalves de Lima	Frederico Pecorelli de Oliveira	MT
Jó Elder Vasconcelos	Raimundo Argemiro Ataide Neto	PA
Rodrigo de Almeida Guedes	Greyce Michelinne Rocha Martins	PB
Leonardo Cordeiro de Araújo	José Altenis dos Santos	PE
Ciáxares Magalhães Carvalho	José Everton Pinheiro Monteiro	RN
Simone Machado Poglia Nunes	Wagner Mendonça Camargo	RS
Edigenia Ferreira Santos	Cecilia Maria Aguiar Guimarães	SE


FORUM
REGIONAL
ENGLISH
LANGUAGE
OFFICE

program's reach

program's reach

> It is incredible to see not only the results that have come out of the TechCamps as projects of action that really came true but the evolution of the people that have come to participate, as well as the structuring of the TechCamp itself, because, as we learn, we improve the techniques to better guide.
>
> Soraya Lacerda, Casa Thomas Jefferson, STEAM TechCamp 2020 trainer

Based on the data collected from surveys, conducted through Google Forms and applied to the participants from the three editions (2018–2020) of the STEAM TechCamp Brasil, and information gathered from reports submitted by the grantees of the Small Grants program, we are proud to conclude that our primary goal has been achieved, expanding with each new edition.

We also found substantial evidence demonstrating that STEAM TechCamp Brasil has trained teachers and managers who are now in contact with teachers and students from schools throughout Brazil. Thus, we have created an extensive network of multipliers with each new edition of the program and anticipate that the number of contacts will increase with subsequent editions.

In its three editions, the program influenced and motivated local actions. STEAM TechCamp participants throughout Brazil have carried out a total of 109 activities.

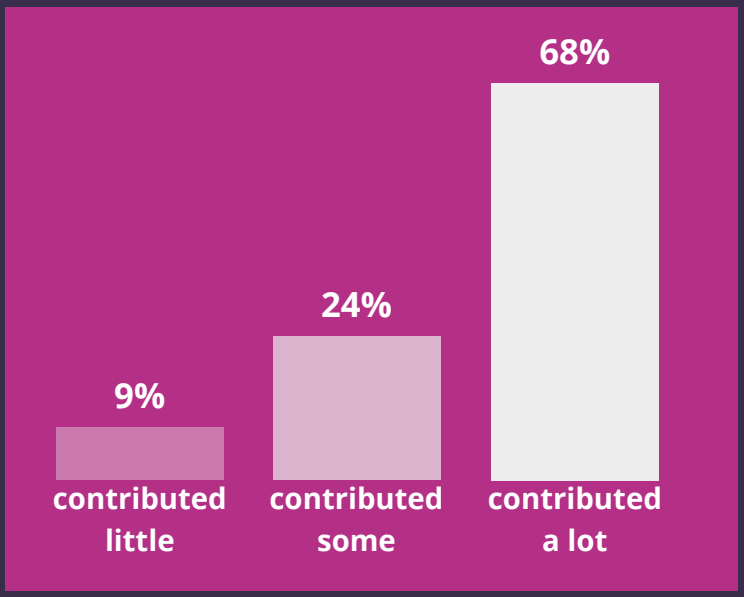
109
activities

11.68%	20.10%	30.62%	37.60%
Hosted a local TechCamp	Hosted a scientific exhibition	Carried out courses and training activities	Carried out educational activities

Activities carried out in 2018, 2019 and 2020, percentage by category.

Did the program contribute to changing the participant's teaching practices and professional activities?

Percentage of total answers (68 answers). The survey was conducted via Google Forms with the participants of the 2018, 2019 and 2020 STEAM TechCamp Brasil editions.



Total numbers of students, teachers, schools and cities indirectly reached through local actions after three editions of the STEAM TechCamp Brasil

140,052 students

857 cities

33,503 teachers

27 Federal units

2,806 schools

The numbers above represent the sum of the participants in the local actions during the 2018, 2019 and 2020 editions. They do not exclude the possibility that the same student, teacher or school has been impacted in more than one program edition.

STEAM TechCamp 2020 investment and outreach

Amount invested in the program	Directly reached people	Indirectly reached teachers
$118,164.00	58	20,690
Indirectly reached students	**Total of reached people**	**Amount invested in each person**
62,372	83,120	$1.42

STEAM TechCamps total investments and outreach for the 2018, 2019 and 2020 editions

Amount invested in the program	Directly reached people	Indirectly reached teachers
$545,564.00	178	33,503
Indirectly reached students	**Total of reached people**	**Amount invested in each person**
140,052	173,733	$3.14

Number of teachers, students, cities, and schools reached in each state that received Small Grants in 2020							
State	**Teachers**	**Students**	**Cities**	**Schools**	**Small Grant in dollars**	**Total of people indirectly reached**	**Amount invested in each person**
AC	2	40	3	4	$2,062.00	42	$49.10
AL	4100	60	102	310	$2,062.00	4160	$0.50
AM	30	200	1	3	-	230	$0.00
AP	40	0	8	20	$2,062.00	40	$51.55
BA	4622	0	200	200	-	4622	$0.00
CE	8000	60000	184	731	-	68000	$0.00
DF	200	150	1	12	-	350	$0.00
ES	5	8	3	3	-	13	$0.00
MA	200	200	18	100	$2,062.00	400	$5.16
MG	41	54	6	4	-	95	$0.00
MT	270	86	13	44	$2,062.00	356	$5.79
PA	50	200	8	20	$2,062.00	250	$8.25
PB	149	0	68	149	$2,062.00	149	$13.84
PE	20	24	17	3	$2,062.00	44	$46.86
PR	2	20	1	1	-	22	$0.00
RJ	4	80	1	2	-	84	$0.00
RN	350	25	28	148	$2,062.00	375	$5.50
RO	10	350	1	1	-	360	$0.00
RR	15	350	1	10	-	365	$0.00
RS	14	25	5	8	$2,062.00	39	$52.87
SE	50	0	15	33	$2,062.00	50	$41.24
SP	16	400	2	2	-	416	$0.00
TO	2500	100	10	38	-	2600	$0.00
Total	**20,690**	**62,372**	**696**	**1,846**	**$22,682.00**	**83,062**	

Data were collected from participants of the 2020 edition through Google Forms surveys.

success stories

success stories
LOCAL IMPACTS

> The greatest wealth I see in this program is this network that makes it possible to meet other colleagues with whom we can share our best practices. We don't need to start from scratch; we can take the knowledge that has already been matured by a colleague in another state and evolve from there.
>
> Edson Duarte, IFSP - Campus Campinas, STEAM TechCamp 2020

During STEAM TechCamp 2019, the United States Consul General in São Paulo, Adam Shub, praised the program by saying: "All of you from STEAM TechCamp Brasil face a great challenge and are doing very important work in this area. We are very happy with the program!"

In addition to the excellent fruits harvested from previous editions, the 2020 edition also generated excellent results. Managers and teachers from the secretariats who have participated in the program have used STEAM TechCamp resources to implement new actions or improve existing initiatives and projects in their communities, focusing on the active learning approach of the STEAM methodology for the teaching and learning process.

Here, we highlight some of the success stories generated by the Federation Units that implemented the planned actions based on the lessons learned during TechCamp. It should be pointed out that, unfortunately, four Federation Units were unable to carry out their projects due to covid-19-related difficulties.

More details about the success stories from the three editions and local action records can be found at the website below (content in Portuguese):

https://stemtechcampbrasil.febrace.org.br/atividades-regionais

ACRE

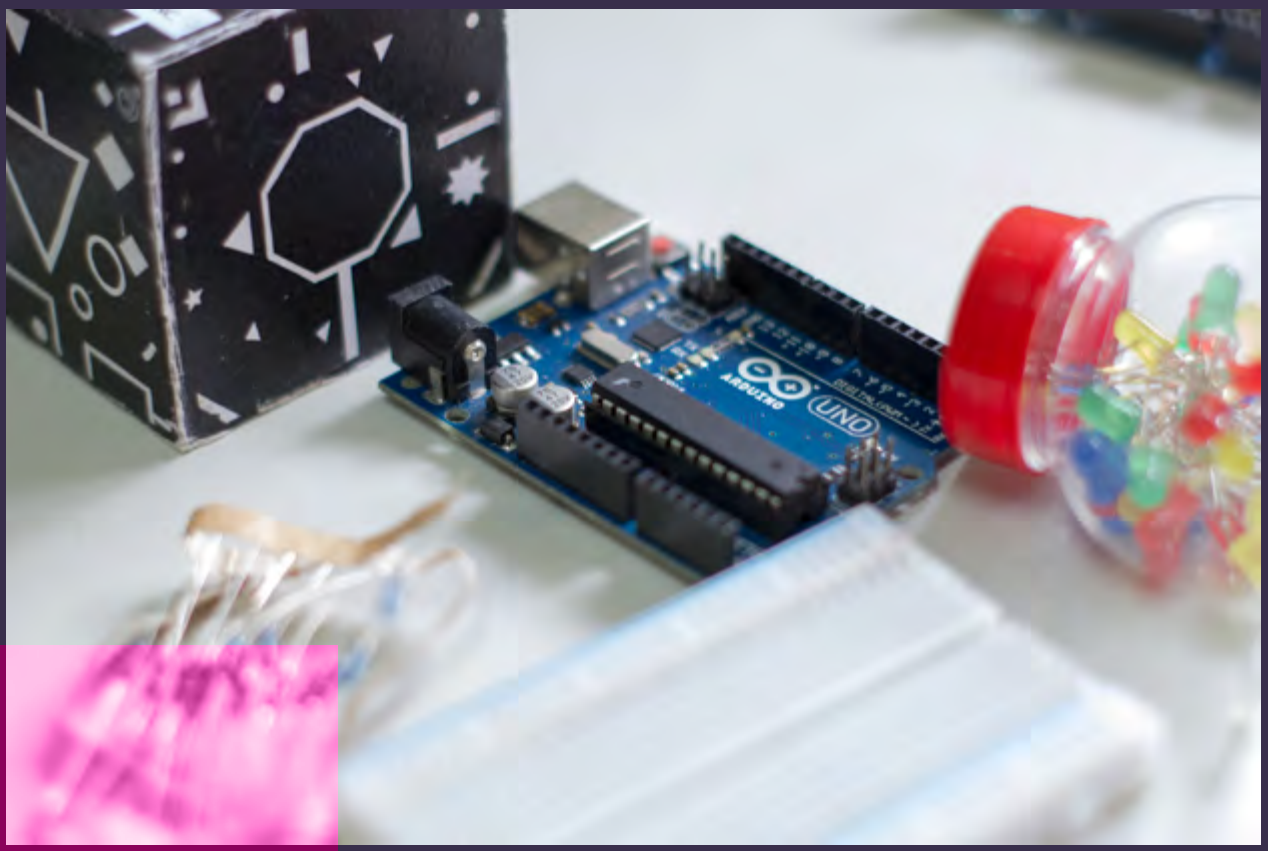
In the state of Acre, the 2020 techcampers carried out virtual activities for students from public schools and offered a course demonstrating the assembly of a robotic hand sanitizer dispenser.

AMAPÁ

Continuing the work started in 2019, representatives of the state of Amapá organized the 2nd TECQUINÓCIO STEAM CAMP, with several workshops and lectures aimed at educators from the state education network. Twenty schools from eight municipalities attended the event.

ALAGOAS

With the money received from the STEAM TechCamp 2020 public notice, the representatives of the State of Alagoas organized the first STEAM TechCamp Alagoas, involving state primary education teachers. There were 1,691 teachers enrolled and about 6 hours of programming to train professionals through Zoom and YouTube's digital platforms. The event involved the participation of nine experts and researchers. In addition, the state organized three training trails with the themes: *Hybrid Teaching: Inverted Classroom, Gamification as an Active Learning Strategy, and Evaluation in Remote Teaching Time.*



AMAZONAS

The IFAM (Instituto Federal do Amazonas) participant developed teaching, research and extension projects with the implementation of an institutional Maker laboratory, supported by the Federal Government, in addition to a series of lectures on Physics.

BAHIA

The state of Bahia carried out several actions aimed at disseminating STEAM practices. For example, the Creative Learning Residencies, a mentoring program on Creative Learning, was initiated and already produced four editions, 78 registered teams and 264 resident educators from 70 municipalities (including nine outside Bahia). In total, 616 hours of mentoring have been carried out, with the support of 47 volunteer "boosters" (the name given to the mentors) from 12 Brazilian states and two from the USA. Seven of these "boosters" were exhibitors or participants in some edition of STEAM Techcamp Brasil.

In addition, teachers had the opportunity to attend courses on incorporating technology (and proposals for activities involving STEAM) into the classroom. They also held the Game Jam Educational, an educator training that incorporates games and gamification into everyday classroom activities.

> "We did a mini version of STEAM TechCamp in Bahia for two days, with 11 teachers from the interior of the state and nine from the capital and metropolitan region.
>
> Geisa Santos da Silva, Secretariat of Education of the State of Bahia, STEAM TechCamp 2020

CEARÁ

The representatives of the state of Ceará used the knowledge acquired through the STEAM TechCamp 2020 to carry out activities aimed at training public school teachers. In addition, the state holds the annual Ceará Científico, a scientific exhibition in three stages: School, Regional and State, with the participation of projects created by students from state public schools.

DISTRITO FEDERAL

In Distrito Federal, FEBRATEC (Brasiliense Technology and Science Fair) was held to train students in STEAM-related topics, Hackathons and sharing of successful activities. The activities involved a total of 12 schools, 200 teachers and 150 students.

> While exchanging experiences with teacher Edson Duarte, from Campinas, whom I met at STEAM TechCamp 2019, we invited him to participate in the training of our trainers in the STEAM Creative course. He collaborated a lot with us, and we trained around 80 teachers in the first group and another 60 in the second group. We also offered several electives oriented to the STEAM approach to the new High School, and it impacted more than 2,500 students. In addition, we managed to articulate some financial support with our Research Support Fund in two notices, one specific for holding scientific events and exhibitions and another to take our students to present their research at national and international fairs. One of the great collaboration points of STEAM TechCamp is precisely this network that we are forming with the wonderful people from across our country and the world.
>
> Fernando Wirthmann Ferreira, Secretariat of Education of the State of Distrito Federal, STEAM TechCamp 2020

ESPÍRITO SANTO

The techcampers of Espírito Santo developed, together with UFES (Universidade Federal do Espírito Santo), a teacher training with the STEAM methodology, the use of tools such as Arduino, and programming in C and C++. Moreover, they organized an exhibition of projects with students who work with the UFES's Mobile Science Project.

MARANHÃO

With the knowledge acquired at STEAM TechCamp 2020, Maranhão representatives held the TechCamp Maranhão, which took place online and had an audience of 200 teachers. During the event, interactive workshops and lectures were held with extremely relevant themes connected with technology, education, digital security and techniques and handling of digital tools.

MATO GROSSO

With the resources of the STEAM TechCamp 2020 award, representatives from Mato Grosso held workshops with STEAM-related themes for teachers from the state education network. They also organized online STEAM School Scientific Exhibitions. The activities involved 44 schools, 270 teachers and 86 students from 13 cities.

MINAS GERAIS

Teacher Enderson Neves Cruz implemented LAB Maker at CEFET-MG Campus Belo Horizonte, working on technical structuring and internal and extension courses in the maker culture and STEAM approach. He also guided the development of scientific initiation projects in the areas of Artificial Intelligence and robotics. Furthermore, Enderson developed a partnership with the Municipality of Betim, a Physics and Robotic Programming project for public schools, to train municipal school teachers to work with physical and robotic programming using the STEAM approach and active methodologies in their schools.

PARÁ

The 2020 representatives of the state of Pará, in partnership with techcampers from previous years, organized the 3rd TechCamp Pará: STEAM Para Todos (STEAM for All, in English), which had around 200 students and 50 teachers from 20 schools.

PARAÍBA

In the state of Paraíba, TechCamp Paraíba taught state teachers about STEAM and Design Thinking practices. The event was attended by techcampers from previous editions and various states, providing a great exchange of experiences.

PARANÁ

Teacher Marcos Aurelio Pchek Laureano, who represented state school teachers at TechCamp 2020, used the knowledge acquired during the program to encourage and guide robotics projects in the school unit where he works.

PERNAMBUCO

In the state of Pernambuco, the STEAM+ Pernambuco was held online. The event involved students and teachers from the state education network and featured conceptual and practical training in STEAM and Robotics with Arduino.

RIO DE JANEIRO

Teacher Joaquim Lopes Pereira, a TechCamp 2020 participant, held training courses and lectures in the city of Volta Redonda, spreading the knowledge acquired during the immersion week. He also organized a scientific olympiad.

RIO GRANDE DO NORTE

Representatives from Rio Grande do Norte held the 1st STEAM Potiguar, with the support of techcampers from previous years. The event was held virtually with the help of Zoom and YouTube platforms, with the objective of training teachers and pedagogical coordinators of the state schools in educational robotics practices, basic computer language using Scratch, creative learning and other resources. Additionally, the event showcased lectures, conversation circles, workshops, and scientific papers developed and presented by Rio Grande do Norte high school students.

RIO GRANDE DO SUL

In Rio Grande do Sul, the 2020 techcampers organized the CanOpel HACKATHON STEAM, a marathon of encouragement and exchange between students and teachers from the state education network. The event's objective was to stimulate the participants to build an educational product that awakens creativity and benefits the school community through sharing experiences during online conversations and workshops. In addition, the Robopel 209 was held to mark the 209th anniversary of the city of Pelotas. The invited students presented workshops that reproduced CanOpel's learning for the entire teaching network in this state.

RONDÔNIA

Representatives from Rondônia reported many difficulties organizing activities during the pandemic but managed to organize the Virtual Environment Event, discussing topics of extreme interest to the region.

RORAIMA

Teacher Manoel Reildo Cerdeira dos Santos, a STEAM TechCamp 2020 participant, used the experiences and knowledge acquired during the Workshop Week to guide scientific initiation projects at his school. He was nominated as a finalist in the 2020 edition of the Grade 10 Educator Award for his excellent work.

SÃO PAULO

In São Paulo, teacher Alberto Alves Marques used the knowledge acquired during his STEAM TechCamp 2020 experience to implement projects in the schools where he works, spreading the concept of STEAM and encouraging the development of scientific projects. Additionally, he helped organize a virtual exhibition of projects.

> "At the school where I work as a History teacher, I already develop some projects related to the theme, for example, the applicability of the STEAM method in the discipline of History. These activities made it possible to participate in fairs such as the 3M exhibition, FEBRACE, FEBIC, FECET and other science and technology fairs in the region. There is an action plan which I am working on together with the representative of the State Secretariat of Education, which we will take to our region to be first implemented in the school and then be replicated in the education board with the objective of reaching the other schools in the state.
>
> Alberto Alves Marques, Escola Estadual Professora Leila Mara Avelino, São Paulo, STEAM TechCamp 2020

SERGIPE

Representatives of the state of Sergipe organized a virtual course on Teacher Training in STEAM, which aimed to train state Nature Sciences teachers about STEAM technologies. The course was divided into three modules: STEAM Approach, Formative Itineraries and First Steps in Arduino. Fifty teachers from 33 schools participated in this event.

TOCANTINS

In the state of Tocantins, continuing education activities about active methodologies and digital tools were carried out for state school teachers.

testimonials

> For many years, education, in general, has been a great priority for the U.S. diplomatic mission in Brazil. But in recent years, we have realized that the area of STEAM (Science, Technology, Engineering, Arts and Mathematics) is an area that we really want to focus on, since for citizens in the modern world, it is very important to have abilities in these areas. TechCamp is just one way that we are engaging educators from all of Brazil, trying to inspire them and provide them with a network to share best practices and information to take to their classroom, particularly as Brazil is engaging in reforms in its public school system that is really allowing greater innovation and creativity in these areas. So, for us, it is a great pleasure for the third time to be participating, and we certainly hope that this is going to be an ongoing tradition.

Erik Holm-Olsen, Public Affairs Counselor of the U.S. Embassy in Brazil,
STEAM TechCamp 2020

> I think this STEAM TechCamp Brasil initiative is very important. We are now in the third edition, and this initiative has the goal of bringing teachers and managers of education networks and state secretariats, as well as researchers, whether from our academia or the USA, to exchange experiences in this perspective of how to work in a more integrated way with Science, Technology, Engineering, Mathematics and Arts as well. Here at Engineering school, for example, we have been working for a long time in this perspective with art in order to stimulate creativity and communication skills, with Design Thinking, for example. And now, at this event, what we are developing with teachers is how we offer activities for our students that are more integrated, more connected with what we have in the real world since the real world is not fragmented.

Roseli de Deus Lopes, STEAM TechCamp Brasil Scientific Coordinator,
STEAM TechCamp 2020

“We have a long-standing partnership. The connection between LSI-TEC, Poli-USP and 3M is already going into its eighth year. And this is a program that we believe is replicable, which can be replicated in other parts of the country, in other states. Sharing good practices and collaborating is our spirit; it is 3M’s spirit. We believe in this as our way of working and promoting knowledge and education

Paulo Gandolfi, R&D Operations Leader at 3M do Brasil,
STEAM TechCamp 2020 supporter

“It is our third year participating in the STEAM TechCamp, and it is incredible to see not only the results that have come out of the TechCamps as projects of action that really came true but the evolution of the people that have come to participate, as well as the structuring of the TechCamp itself, because, as we learn, we improve the techniques to better guide, the campers, as we like to call them. I see that this is a very incredible opportunity to instrumentalize the teacher and the manager. This combination of participants is also precious because there we have both sides of the coin working together for actions. We managed to instrumentalize them, bringing tools of methodology to help them better organize their thinking and ideation for these plans of action. I see how the result is achieved in a positive way through the projects, especially when campers from previous years present their good practices, their success stories. It is exciting to see these results being presented.

Soraya Lacerda, Casa Thomas Jefferson,
STEAM TechCamp 2020 trainer

“

The whole idea around the STEAM philosophy and the STEAM-centered approach to education is to treat learners as holistically as possible. We know that learning does not happen in silos. We also know that as adult learners, we learn science at the same time we learn arts, the same time we read, the same time we write, so taking that philosophy and applying it to the classroom enables our students to think independently and grow into lifelong learners.

Amy Homma, Director of Education and Public Engagement - Academy Museum of Motion Pictures, STEAM TechCamp 2020 trainer

“

What I am enjoying the most is the exchange of experiences, being with several states, talking to other teachers. We share what we have achieved in one way, what someone else has achieved in another, how to engage young people. It has been wonderful! And I have learned a lot from the professionals who are participating.

Geisa Santos da SIlva, Secretaria de Educação da Bahia, STEAM TechCamp 2020 participant

“

I believe that this movement enabled by the STEAM TechCamp Brazil Program mobilizes teachers who have been working with their traditional methodologies and approaches for a long time, allowing them to leave their comfort zone and, little by little, realize that learning involves much more than theoretical knowledge. Hands-on, combined with creativity, produces much more satisfying results, both for students and teachers. This movement gives ‘fuel’ to breaking with conservative educational practices. And here is a very relevant fact: in addition to the student, the teacher feels much more motivated as well, which directly affects their classroom practice, including their affection towards their classes.

Simone Machado Poglia Nunes, Secretaria de Educação do RS, STEAM TechCamp 2020 participant

“

The STEAM TechCamp Brazil Program is fundamental since it provides basic training and engagement to develop thoughts in the STEAM area. I believe that this type of program is essential for the country’s social and technological development.

Marcio Peters, Secretaria de Educação do Espírito Santo, STEAM TechCamp 2020 participant


SAMSUNG

conclusion

Despite all the adversities imposed by the covid-19 pandemic, the 2020 edition of the STEAM TechCamp Brasil program achieved the planned goals. This year's program involved 58 educators and state education managers that want to plan and implement new tools and dynamic program approaches in the STEAM field for secondary level students. Through these participants, we created relationships and networks with local professionals in each region and supported and shared STEAM practices via several initiatives such as organizing local TechCamps, science fairs, educational activities, and courses and training in STEAM.

To achieve the program's positive results, the strategy of involving a State Secretariats of Education manager and a teacher, both with experience in managing school programs and classroom practices, from each Brazilian state was fundamental. The selection of the participants was based on a refined approach to identify educators who were already engaged and motivated to perform innovative actions and practices in their communities. We observed that their involvement created an environment and a network that facilitated sharing experiences and stimulated the collective construction of STEAM-related learning practices.

The Workshop Week provided the participants from each state with the opportunity to develop their STEAM practices action plans. Notably, the Small Grants program offered to selected participants stimulated the awardees to put their developed plans into practice.

The most significant difficulty faced by the program was covid-19 imposed restrictions and

other pandemic-related obstacles (e.g., social distancing and remote activities). Unfortunately, in some states, the development of the proposed STEAM action plans was delayed and impossible.

Despite these misadventures, the organization took all of the necessary measures to ensure that the program was as successful as possible, getting the most out of the potential of the teachers and managers and encouraging the realization of virtual activities whenever possible. Due to their augmented accessibility, the online activities yielded positive results, reaching even more professors and students.

Altogether, all 27 Brazilian Federal Units were reached in these three editions, and the participants contributed to building a network of multipliers that has reached 857 cities, 2,806 schools, 33,503 teachers, and 140,052 students. These results highlight the importance of continuing the action plans and activities from STEAM TechCamp Brasil. With continued support, we will teach more educators, managers and students about the STEAM educational approach and connect these individuals, facilitating knowledge exchange that could further improve this teaching approach.

organizing committee 2020

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