MiSTEM Network

MiSTEM Advisory Council

2022 Annual Report & 2023 Recommendations

“Strong STEM experiences prepare students for the high-skilled jobs of the future and lay the foundation for prosperity in our communities. When we help our students explore the world of STEM, we make an investment that keeps Michigan at the forefront of scientific and technological advancement and builds on our state’s tradition of innovation.”

– Lt. Gov. Garlin Gilchrist II

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Letter From MiSTEM Advisory Council Chair

As chair of the MiSTEM Advisory Council, I'm focused on helping prepare our students for the demands of the future while setting Michigan up for long-term prosperity. Education has long been viewed as an investment in the future, and that couldn't be more true for STEM education. As Michigan works toward our educational goal of 60% of adults attaining a postsecondary degree or certificate by 2030, STEM is a vital piece of that effort. It lays the groundwork for economic vitality now and several decades down the road.

We have a strong talent base, quality educational institutions and thriving industries all poised to propel Michigan into the forefront of STEM education. STEM careers have median incomes of more than double that of non-STEM occupations. And with the fourth-largest engineering and development workforce in the nation, Michigan is ready to lead.

Evolved STEM education engages both teachers and children in authentic experiences in the real world that keep them motivated to learn. Research shows that students who participate in STEM 3P (place-, project- and problem-based) learning demonstrate increased performance in their overall schoolwork, improved test scores and increased graduation rates. Not to mention, STEM education equips students with the type of skills that are valuable no matter what their career path looks like — skills like collaboration, critical thinking and innovation. STEM learning builds on curiosity to help our young people become lifelong learners — the type of learners who can adapt to whatever the future holds.

The MiSTEM Network stands ready to help local school systems implement high-quality STEM experiences, find business and community partners and create equitable, inclusive change by investing in places with demonstrated inequities. There has never been a better time to prioritize STEM education and there has never been a greater need.

Sincerely,

Sarah Szurpicki
MiSTEM Advisory Council Chair
Director, Office of Sixty by 30
Michigan Department of Labor and Economic Opportunity

MiSTEM Advisory Council Members

The MiSTEM Advisory Council brings together education, business and community leaders across Michigan. The combined knowledge, experience and commitment of our engaged leaders ensure that every community in Michigan has high-quality, equitable STEM experiences.

Christian A. Velasquez, Midland
Strategic Leadership & Consultant for Business, Commercial, Politics & Foundations

Daniel Williams, Ph.D., Grand Rapids
Vice Chair, President and Chief Executive Officer, Steelcase Foundation

Delsa Chapman, Ed.D.
Deputy Superintendent for Educator, Student, and School Supports, Michigan Department of Education

Gail S. Alpert, West Bloomfield
President, FIRST in Michigan

Heidi Maltby-Skodack, Traverse City
Director of School Improvement, STEM/CTE, Traverse City Area Public Schools

Jacqueline Huntoon, Ph.D., Houghton
Provost, Professor of Geology, Michigan Technological University

Lee Graham, Holly
Executive Director, Operating Engineers 324 LMEC

Rema Reynolds Vassar, Ph.D., Detroit
Associate Professor, Eastern Michigan University

Sarah Szurpicki, Chair
Director, Office of Sixty by 30, Michigan Department of Labor and Economic Opportunity

Wendy A. Winston, Grand Rapids
Educator, Grand Rapids Public Schools

Sen. Dayna Polehanki

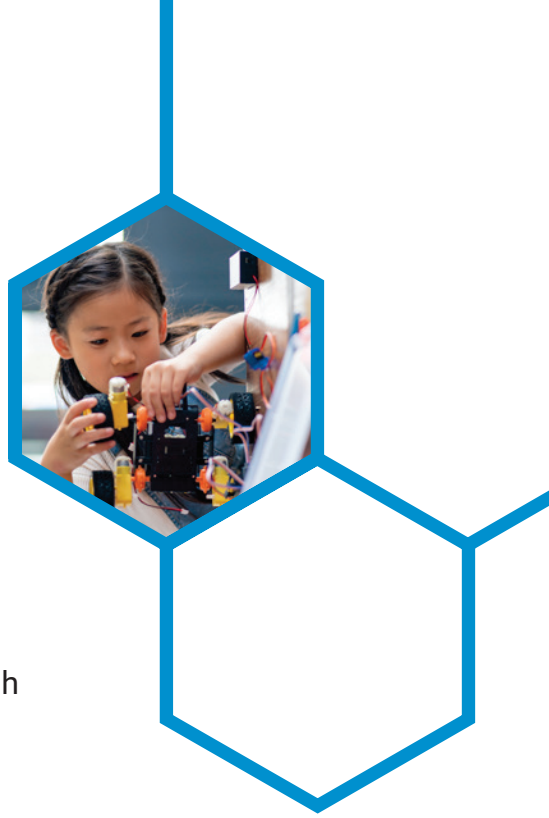
Sen. Dale Zorn

Rep. Padma Kuppa

Rep. Brad Paquette

The MiSTEM Advisory Council was created in 2015 under MCL 388.1699s and organized under the Department of Labor and Economic Opportunity per Executive Order No. 2019-13. The Council is made up of 11 voting members serving at the pleasure of the governor and four ex-officio legislators appointed from the House of Representatives and Senate.

MiSTEM Advisory Council



The MiSTEM Advisory Council is charged with setting a strategic vision for STEM in Michigan and moving that vision to action through the MiSTEM Network. The Legislature relies on this Council to make recommendations to advance STEM education in Michigan.

Specifically, the Council has the following legislated functions:

- Recommend and advance a statewide strategy for delivering STEM education opportunities to K-12 students in Michigan
- Strengthen the STEM ecosystem and address inequities through grants that meet the objective criteria set forth in legislation
- Activate and support the MiSTEM Network to improve and promote innovation and collaboration in STEM education

MiSTEM Mission & Vision

Established by the MiSTEM Advisory Council, the MiSTEM Network was created to make STEM learning more accessible across the state, bringing people and practice together to implement innovative learning experiences beyond the physical classroom.

Through 16 regional hubs across Michigan, the Network unites education, business and community partners to create pathways for all students to consider and pursue high-wage, high-demand careers.

Together, the MiSTEM Advisory Council and MiSTEM Network have set forth a guiding mission and vision, clearly defining our unique place in the Michigan STEM ecosystem and our collaborative purpose.

Our Vision

Michigan is home to a generation of innovators who create more inclusive and prosperous businesses and communities.

Our Mission

Be the catalyst for equitable access and engagement in authentic STEM experiences in every community in Michigan.

MiSTEM Advisory Council Report Executive Summary

> **"There has never been a better time to prioritize STEM education and there has never been a greater need."**
>
> **— Sarah Szurpicki, MiSTEM Advisory Council Chair**

Transforming the Culture of STEM in Michigan

Seventy-six percent of Michigan adults agree that STEM education is the best pathway to high-paying jobs for young Michiganders. However, a full 36% of Michigan parents report that their children do not participate in any STEM learning either inside or outside of school.

How will we engage children in the STEM learning experiences that will prepare them for the high-demand, high-wage jobs of Michigan's future? How can we build pathways to prosperity that reflect the diversity of our communities and build on our state's tradition of innovation? How will we reach Michigan's goal to increase the number of skilled and credentialed working-age adults from 49% today to 60% by 2030? STEM is critical not just because the subject matter is increasingly relevant but also because approaches to teaching STEM foster the type of skills that students need to be curious lifelong learners, no matter the discipline — crucial in today's ever-changing economy.

The MiSTEM Advisory Council stands ready to empower equitable STEM learning experiences across the state through grant-making efforts and legislative advocacy. We hope that you share our powerful vision of Michigan as home to a generation of innovators creating inclusive and prosperous businesses and communities. It is our mission to catalyze equitable access and engagement in authentic STEM experiences in every community in Michigan.

Our Impact in 2022

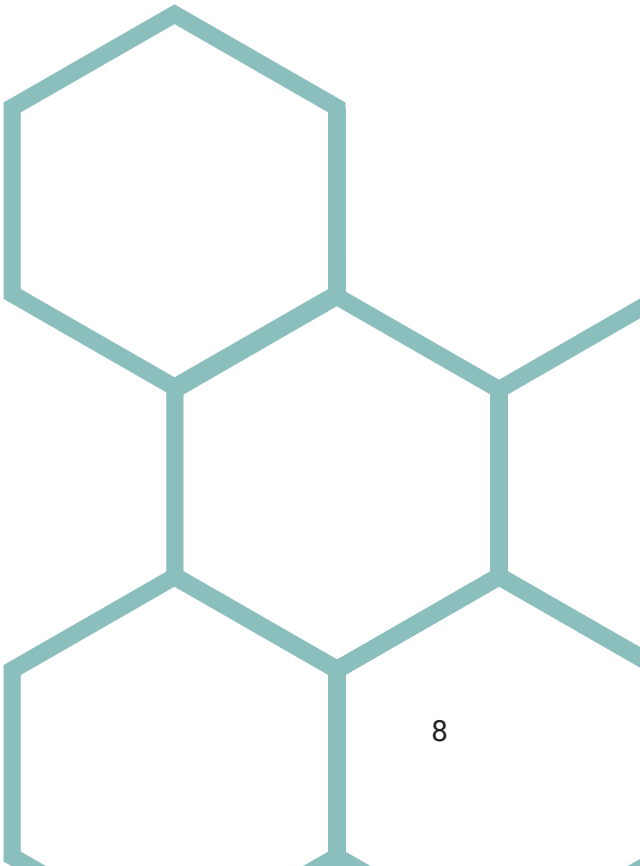
- Distributed $3.05 million in grant funds, increasing access to STEM programs in robotics, engineering and bioscience, computer science and coding.
- Catalyzed $1.36 million in outside funding from 40-plus organizations, leveraged by grantees.
- In partnership with MDE, developed a computer science vision and a statewide strategic plan, and increased access to computer science programs by 150%.
- Served 1,801 schools.

2023 Fiscal Year Budget Reccomendations

Our recommendations focus on effectively and efficiently scaling best practices statewide to accelerate the culture of STEM and STEM learning opportunities throughout Michigan.

- **Recommendation One:** Focus All Grant Funds on Problem-, Place- and Project-Based Learning, commonly called "3P learning." Align all grant criteria and associated activities under this core focus area to develop and implement innovative, integrated STEM learning experiences. $0 *Shifts the focus of expenditures and requires no additional funds.
- **Recommendation Two:** Invest in Strategic Partnerships to deliver high-quality 3P STEM experiences, creating the infrastructure to build business-community-education STEM partnerships. $10,000-$20,000
- **Recommendation Three:** Develop and deploy a communications campaign to Inspire STEM Engagement, to motivate participation in STEM education and connect learning to career pathways. $1.5 million
- **Recommendation Four:** Measure Education and Workforce Outcomes Track and report success in alignment with the state's Sixty by 30 goals and federal STEM goals. $200,000

The MiSTEM Advisory Council is committed to meeting Michigan's education and workforce goals, with the support of our dedicated partners and advocates. With this critical investment, we will continue our momentum in creating meaningful and measurable impact for our schools, our teachers and students, our workforce and our communities.



2022 Year In Review

Priorities

The MiSTEM Advisory Council established three priorities to move Michigan forward in 2022:

1. **Strengthen the MiSTEM Network** to address disparities and inspire new, dynamic ways of learning in and out of the classroom.
2. **Contribute to the COVID-19 response**, helping educators and students transition and reimagine diverse learning environments.
3. **Elevate the need for computer science** and provide access to programming, which will help an entire pipeline of students find achievement and success in high-demand, high-wage careers of tomorrow.

Impact

Highlights of this work, and evidence of impact include*:

Distributed $3.05 million in grant funds, increasing access to STEM programs in robotics, engineering and bioscience, computer science and coding.

Focused efforts toward building and measuring equity and inclusion. Deployed activities to address disparities among underrepresented educators and students.

In partnership with MDE, developed a computer science vision and a statewide strategic plan, and increased access to computer science programs by 150%.

Development of innovative learning models and resources to connect classrooms to careers.

Helped schools and educators deliver hybrid/virtual STEM learning and adapt programs to continue learning outside the classroom.

Grew our network of collaborators and community partners who contribute to the rich contexts of learning.

*Specific data referenced in Appendix C: Advisory Council Grant Report

MiSTEM Network: Transforming STEM Education Together

The COVID-19 pandemic disrupted education for an entire generation of young people. It forced schools to tackle disparities and adopt new models of teaching, it motivated educators to seek out new partners and resources, and it encouraged students and families to consider adapted models of learning. It challenged us all to think differently about education and build new skills together

It also made our work more urgent. The pandemic challenged the MiSTEM Network to elevate and transform our system of engagement and to provide immediate solutions. Each success from the past year demonstrates tremendous progress in delivering authentic STEM experiences across Michigan. And these successes were critical to supporting educators and students during the pandemic. **But it is not enough.**

We have only just begun in our efforts to bridge the education and business communities to create more active and dynamic learning models that mirror the experiences our youth will have in the real-world work environment. We are uniquely positioned to serve as the catalyst for future transformations. As a partner to both the Michigan Department of Education (MDE) and the Michigan Department of Labor and Economic Opportunity (LEO), the MiSTEM Network has the convening power to drive STEM infrastructure and prepare students for the evolving workforce.

The network approach is the best-possible strategy for connecting students with STEM educations and high-demand, high-paying careers. Working statewide allows us to adopt a more equitable approach based on resource sharing and targeted capacity building. The network also provides the opportunity to spread best practices through training and peer-learning.

As we are working to connect communities across the state, STEM learning is evolving to be more connected to real life challenges. **This integrated and interdisciplinary approach to learning and skill development is called "3P learning,"** referencing project-based, problem-based, and place-based learning. It includes the teaching of academic concepts through real-world applications, combining formal and informal learning in schools, the community and the workplace.

The MiSTEM Network has mobilized collaborators across Michigan to broaden the STEM ecosystem and embrace 3P learning experiences beyond the classroom. We have expanded and accelerated this work so that every student can learn and use STEM skills to address authentic challenges in their community.

3P Learning: Integrated STEM Education

3P Learning stands for problem-, project- and place-based learning that creates authentic, meaningful and personalized learning for students through experience.

Problem-based learning: Children learn about a subject through the experience of solving a problem. It encourages exploration and experimentation, knowledge-seeking, group collaboration and communication.

> **Example:** A community's water supply was compromised due to high flooding, which contaminated the local reservoir. Students devised ways to prevent recurrences, determined which was more economical and presented the solutions to City Hall.

Project-based learning: Children learn in the context of a sustained, real-world project, creating something tangible such as a product, performance or event.

> **Example:** There was a small, unused plot of land by a community school. Students devised a use for the land, wrote letters to stakeholders, applied for grants for materials, brainstormed sustainable ways to make the idea happen and actualized the vision.

Place-based learning: Connects learning and communities, emphasizing learning through participation where children make tangible contributions to help improve their community.

> **Example:** Houghton Middle School students conducted experiments on surface and groundwater contamination, developed strategies to reduce the impacts of nitrates on water quality and presented recommendations to the state of Michigan.

Student-Centered STEM

3P Learning gives students “voice and choice” in determining what, how, when and where they learn. It tailors learning to each student’s strengths, needs and interests while promoting social-emotional development such as self-awareness, self-management, relationship skills and responsible decision-making.

3P Learning:

- Ensures mastery of high academic standards through applied learning.
- Encourages critical thinking and problem-solving skills.
- Exposes students to real-world challenges and STEM career pathways.
- Builds confidence and encourages persistence through STEM.
- Increases student and teacher engagement.
- Connects children to their community in meaningful ways.

Watershed Warriors: 3P Learning in Action

Student Engagement: Explore environmental science, learn the basics of working in a lab, safely conduct chemical sampling, survey local residents and discuss scientific findings with community members.

Students: Get real-world exposure to STEM learning and careers while engaging in critical problem-solving skills.

Teachers: Become empowered, reinvigorated, more satisfied and successful in the classroom and more connected with the community.

Businesses: Students connect education with STEM careers and gain real-world training that translates to future jobs and impact.

Community: Helps improve water quality in the Flint River Watershed.

Partners: MiSTEM Network Region 6, Flint River Watershed Coalition, Genesee Intermediate School District, Genesee Career Institute, Genesee Opportunity.

Expanding 3P Learning

In the past year, the MiSTEM Network expanded 3P learning opportunities to connect classroom to career by:

- Facilitating growth (+2,000%) in 3P experiences for teachers and students.
- Partnering with the Michigan Department of Environment, Great Lakes, and Energy to provide grants and support to 16 schools to develop Great Lakes-based science, technology, engineering and math programs offering students access to real-world STEM experiences.
- Cultivating new partnerships with STEM education stakeholders, including businesses, nonprofits and higher education institutions to provide 3P instruction and career/ workforce exploration.

Many positive STEM efforts are happening across Michigan. The MiSTEM Advisory Council aims to get all partners and efforts moving in the same direction, with a more efficient and effective way to replicate and scale successes.

*Additional successes can be found in Appendix B: MiSTEM Network Impact Report.

2023 MiSTEM Advisory Council Recommendations

The statewide strategy for STEM education in Michigan is centered on four pillars to help move STEM forward and drive equitable access and engagement in authentic STEM experiences in every community in Michigan.

The four pillars are:

1. Create a STEM culture.
2. Empower STEM teachers.
3. Integrate business and education.
4. Ensure high-quality STEM experiences

For 2023, the Council has identified the following recommendations to implement this strategy:

1. **Focus all grant funds on 3P learning.** Align all grant criteria and associated activities under a single core focus area to develop and implement innovative, integrated 3P STEM learning experiences.
2. **Invest in strategic partnerships to deliver high-quality 3P STEM experiences.** Create the infrastructure to build business-community-education STEM partnerships
3. **Inspire STEM engagement.** Motivate participation in STEM education and connect learning to career pathways.
4. **Measure education and workforce outcomes.** Track and report success in alignment with the state's Sixty by 30 goals and federal STEM goals.

Recommendation One: Focus All Grant Funds on 3P Learning

In 2022, the Council distributed MiSTEM grant funds toward three areas of focus: strengthening the Network, navigating STEM education through the COVID-19 pandemic and elevating computer science opportunities. These grants were widely implemented across the state, positively impacting hundreds of thousands of students and educators.

The decision to focus on 3P learning going forward was based on research conducted in the spring of 2022 to measure program success and identify opportunities for future impact. **The MiSTEM Evaluation Committee recommended moving toward a more focused approach — to select one primary area of focus — to amplify the collective impact of annual STEM funding.** This would give all 16 regions a common, cohesive goal as well as consistent expectations for their programs and services. This would not require additional funding, only a focused shift of existing expenditures.

The Advisory Council supports this recommendation and would require all future grants, funds and programs to be focused on expanding 3P learning opportunities and the sustaining infrastructure.

This is how we will effectively bring together STEM actors within and across regions in a research-informed way to:

- Transform K-12 STEM learning with innovative and integrated education.
- Create business-community-education STEM partnerships.
- Build equitable, inclusive change by investing STEM resources and opportunities in places they don't often go.
- Scale STEM successes in our regions related to MiSTEM goals and culture.

Dedicated and focused investment today toward 3P learning and its infrastructure will benefit students, educators, business and our communities far beyond the life of state grant efforts.

Recommendation Two: Invest in Strategic Partnerships

> **"A healthy STEM ecosystem builds stronger, more informed communities, producing a more diverse workforce with the skills needed by local employers."**
>
> **— Federal STEM Education Strategic Plan**

The federal government's most recent five-year strategic plan for STEM education identified strategic partnerships as a key to success. It focuses on aligning what is taught and learned with what is valued in workplaces and communities. The plan encourages the collaboration of professionals who interact with learners at critical points in their education pathway — including K-12 educators, informal education such as 4-H programs, community colleges and universities, employers and community advocates.

One of the key federal recommendations for strengthening partnerships is to establish a single, searchable online resource for finding and funding STEM-related partnerships, activities and funding resources.

Michigan is fortunate to already have a tool like this in place — though it's currently used only at a small scale. Ann Arbor SPARK — through a grant from the Michigan Economic Development Corp. — has developed the Michigan STEM Forward initiative to match college students with internship opportunities at the state's leading innovative companies. Michigan STEM Forward is a "matching tool"* that provides students meaningful career experience and promotes job retention in the state, while providing financial support to companies that hire these interns.

*For an example from Washington State, see the Tools section at WashingtonSTEM.org.

The Department of Environment, Great Lakes, and Energy has also developed a tool to connect businesses and other community partners that are willing to engage with youth interested in freshwater education. This searchable spreadsheet has proved invaluable to communities that are growing 3P freshwater programming for youth through our joint STEM Playbook grant efforts. The development of this tool has uncovered two fundamental realities that drive our recommendation to invest in strategic partnerships:

1. Schools need help in building these relationships. This tool helps both build relationships and sustain them beyond our grants.
2. Our state is flush with partners willing to share their expertise and programming with youth, yet we lack a central resource where communities can connect with valuable partners.

We know we can do better in more efficiently connecting our future workforce with stewards of our state.

The MiSTEM Advisory Council recommends one-time funding for the development of this type of "matching tool," or expansion of an existing tool, that will help move STEM forward in Michigan. The matching tool would provide the infrastructure to foster STEM partnerships among schools, educators, businesses, and community leaders. It would help to connect youth and educators with meaningful STEM career development experiences through internships, externships and other opportunities. It would also arm the Network with the ability to scale best practices faster and become more efficient and effective at building a stronger STEM ecosystem that produces a more diverse workforce with the skills needed by employers.

This matching tool could also gain use by other state of Michigan departments to link students and employers across various industries. The Michigan Department of Agriculture & Rural Development, Department of Health and Human Services, the Community Service Commission and the Michigan Women's Commission have all shown interest in this tool to accelerate our collective progress in building future talent. Refer to Appendix C to review proposal.

Recommendation Three: Campaign to Inspire STEM Engagement

Inspiring the next generation of innovators means showing educators and communities how to pioneer STEM education. It means encouraging partners to engage in new STEM learning experiences. It means inviting new students to advance their skills and passion for learning through hands-on, real-world applications. It means helping youth find belonging in STEM and connecting them with careers that will fuel future jobs and innovation.

The MiSTEM Network is making great strides in many of these areas by, for example, creating STEM Playbooks for communities to implement 3P STEM experiences and increasing equitable access to STEM programming through grants and strategic partnership. However, we have not yet had the opportunity to inspire engagement by all in these activities or expand outreach to those underrepresented in STEM careers to build inclusivity and a sense of belonging.

The policy language behind the MiSTEM Network calls for a marketing campaign to build STEM awareness and communicate STEM needs and opportunities to students, parents, educators and the business community (MCL 388.1699s (12) (b)).

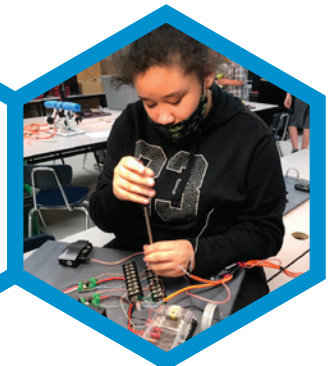
To date, our funding has allowed for only limited communications efforts, which we have used to:

- Establish the identity of the Network
- Create and maintain our website
- Support our 16 regional hubs in ongoing communications efforts
- Conduct survey research to inform a future communications campaign

Key findings from this survey research demonstrate the need to expand access and inspire engagement. The most notable findings:

- **Only 8% of children participating in STEM learning both inside and outside of school** – where they can integrate academic learning with real-world challenges (3P Learning)
- **Households earning under $35K** were most likely to report that their children did not participate in any STEM learning.

The MiSTEM Advisory Council recommends an increase to the 2023



budget to implement a communications campaign. With all MiSTEM grants focused on increasing equitable access to 3P STEM learning, it will be imperative to inspire engagement in these activities — particularly in Michigan's most minoritized communities. Güd Marketing has prepared a memorandum detailing cost to design, implement and maintain a marketing effort for this initiative (Appendix C). A dedicated communications effort would promote these authentic STEM experiences — motivating educators, youth, families, employers and communities to collectively engage in this evolved learning model.

Adult Attitudes Towards STEM in Michigan Survey Research Key Findings:

***The complete research report can be found in Appendix D.**

- STEM in Michigan is very important (75%).
- The best way to learn STEM is through hands-on learning (88%).
- STEM skills are necessary to ensure students succeed as careers shift in the future (87%).
- Students with STEM skills are critical to keeping the Michigan economy competitive (86%).
- Significantly more resources need to be put toward STEM education in Michigan (77%).
- STEM education is the best pathway to high-paying jobs for young Michiganders (76%).

The survey also acknowledged the need for business-school partnerships — a critical component of our 3P STEM strategy:

- Businesses and schools need to work together to ensure schools are teaching skills needed for the workforce (92%).

However, Michigan parents report limited engagement in STEM learning:

- Children do NOT currently participate in STEM learning (36%).
- Children participate in STEM learning ONLY at school (45%).
- Children participate in STEM learning BOTH at and outside of school (8%).

Notably, households earning under $35K (44%) were the most likely to indicate that their children do not participate in any STEM learning.

Recommendation Four: Measure Education and Workforce Outcomes

For fiscal year 2022, the MiSTEM Evaluation Committee set common metrics to evaluate program success and inform future needs and opportunities (a full report of findings can be found in Appendix E). **For fiscal year 2023, the Committee recommends continued measurement of program outputs in focus areas demonstrating improved STEM education and strengthened STEM workforce development such as:**

Focus Area 1: Improved STEM Education

- # of student participants
- # of programs, titles, descriptions
- # of program audiences
- # of advanced coursework
- # of advanced degrees
- # of STEM certifications
- # of AP, middle college, dual enrollment
- # of schools and districts

Focus Area 2: Improved Strengthened STEM Workforce Development

- # of teacher participants
- # of businesses and community partners
- # of projects with business and community partners
- # of matching resources from partner projects
- # of teachers served
- # of students served
- # of others served
- # of schools and districts
- # of students with STEM identity
- # of students with STEM career interests
- # of teachers with STEM efficacy

Evaluation efforts moving forward will include more focus on measuring outcomes in alignment with the state's Sixty by 30 goals, which seek to close the skills gap and boost attainment of postsecondary degrees or certificates to 60% of adult Michiganders by 2030. **These outcome measures of success include:**

1. Equitable growth in student knowledge and interest in STEM careers.
2. Teacher knowledge about STEM careers for students.
3. Student STEM test scores, advanced coursework and postsecondary credentials.
4. Business-community-education partnerships around STEM learning and careers.

This will require a more comprehensive evaluation of MiSTEM efforts — of all grants (Region grants, Council grants, Playbook grants) and communications to ensure we are identifying best practices and scaling efforts across the state in the most effective way to meet these ambitious outcomes.

As such, the Council recommends that the MiSTEM Network identify an evaluator who can connect and measure all STEM efforts in coordination with our goals as a state. The MiSTEM Advisory Council is committed to meeting Michigan's education and workforce goals and filling the projected shortage of qualified and skilled job seekers. Through our efforts, and the collaboration of our partners, we will make meaningful and measurable outcomes that will positively impact our schools, our teachers and students, our workforce and our communities.

Budget Recommendation

The MiSTEM Advisory Council presents the following additional budget recommendation to achieve these priorities:

Strategic Recommendations	Estimated Budget
Recommendation One: Focus All Grant Funds on 3P Learning	**$0***
Recommendation Two: Invest in Strategic Partnerships	**$10,000-$20,000**
Recommendation Three: Campaign to Inspire STEM Engagement	**$1,500,000**
Recommendation Four: Measure of Education and Workforce Outcomes	**$200,000**

Appendix

Appendix A: Advisory Council Grant Report

Appendix B: MiSTEM Network 2021-22 Impact Report

Appendix C: IS MiSTEM Proposal

Appendix D: Marketing Budget Proposal

Appendix E: Research Report

2021 Advisory Council Grant Report

Supporting Opportunities for Every Student in Michigan to Engage in STEM Programming

DESPITE COVID-19 CHALLENGES, MiSTEM GRANT PROGRAMS GROW; IMPACT ON STUDENTS AND EDUCATORS FLOURISHES

Reach of the MiSTEM Advisory Council Grant Programs in FY21

The MiSTEM Advisory Council funded 15 STEMworks programs during the 2020-21 fiscal year to provide professional development for educators, hands-on learning experiences for students, and combined teacher-student programming. This year, MiSTEM grantees demonstrated a 79% increase in collaboration, growing partnerships within and across communities.

Teacher Participation

Fourteen grants provided educator **professional development**. Teacher participants increased by 53% from FY '19-'20. Schools served with educator programming increased by 200%.

2,465 Teacher Participants

1,801 Schools Served

3,188.75 Reported PD Hours

Program Spotlight

Students were served across four grant-funded programs. **Cereal City** was implemented in seven new regions. The **Great Lakes Stewardship Initiative** increased participation from seven to 10 regions.

23,780 Students Impacted

861 Students Served Directly

215% Increase in Students Served by Direct Programming

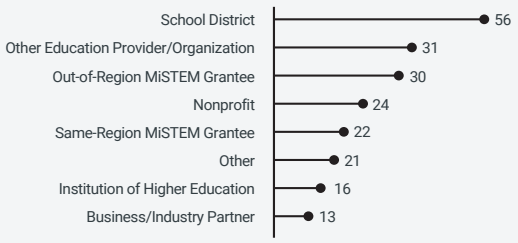
Outside Resources Obtained by Leveraging Council Grant Funds

The MiSTEM Advisory Council encourages its grantees to leverage funds received to obtain additional funding and to pursue collaborations with other organizations.

213 Total Collaborating Organizations

42 Total Funding Organizations

$1,364,524 Total Amount Received From External Funding



COVID-19 Response

100% of grants stated programming was affected by COVID-19

- Programs didn't need to postpone this year, but altered programming in various ways.
- Modifications to accommodate changing protocols, including masks, social distancing and delayed start dates, were reported.

Two-thirds of programs reported needing to provide some virtual element to the programming.

25%+ Over 25% of grantees described fighting for their programming in the face of administrative and pandemic-related pressures.

50% Half of grantees described heavy impacts of COVID-19 on teacher engagement and capacity in their respective programs.

"Schools delayed decision-making due to COVID, which made planning difficult."

FY22 Grant Funding by Program

ESTIMATED IMPACT

Students 189,855 **Teachers 3,857**

TOTAL FUNDS AWARDED PER LEGISLATED FOCUS CATEGORIES

Computer Science and Coding ($300,000)

Workshops
Expanding Learning Program-Conference
Code.org: 9-Day Professional Learning
Code.org: CS Fundamentals
Bootstrap: Data Science Workshop
Statewide Coalition/Alliance Building
Bootstrap: Data Science (Math Collaboration)
Statewide Coalition/Alliance Building

Mathematics ($296,800)

Math Recovery AVMR 1
Math Recovery AVMR 2
Math Recovery AVMR Fractions
Math Recovery Intro Sessions
Math Recovery Virtual PLC
Bootstrap Data Science (CS Collaboration)
YouCubed Data Science
Culturally Responsive Math
Statewide Coalition/Alliance Building

Science ($282,630)

Great Lakes Stewardship Initiative
Cereal City Science
Phenomenal Science
Camp Invention
Mi-STAR
Modeling
STEM Equity Pipeline
Next Generation Science Exemplar
MiSNGSX Facilitators Group
SOLID Start
Statewide Coalition/Alliance Building

MiSTEM Network 2021-22 Impact Report

The MiSTEM Network

The MiSTEM Network is working to transform the culture of STEM in Michigan – driving STEM infrastructure to prepare students for the evolving workforce.

Through 16 regional hubs across Michigan, the Network mobilizes collaborators to broaden the STEM ecosystem and embrace learning experiences beyond the physical classroom. We work to connect education, business and community partners so that every student can learn and use STEM skills to address authentic challenges in their communities.

Our vision is to be a home to a generation of innovators who create more inclusive and prosperous business and communities.

MiSTEM Pillars

2021-22 Impact Highlights

- Mobilized the Network to **expand project-, problem-, and place-based (3P) learning opportunities** that bridge classroom to career
  - **Expanded (39) and cultivated (17) new partnerships** with STEM education stakeholders, including businesses, non-profits, higher education institutions, to provide 3P instruction and career/workforce exploration for students
  - Facilitated over **2,000% growth in offerings** of 3P experiences for teachers and students and provided **93 3P literacy, outdoor experiences and curriculum support**
  - Provided **$205,028 in grants to 16 schools** to develop Great Lakes-based science, technology, engineering and math (STEM) education programs that will offer students access to real world STEM experiences
- Elevated computer science offerings with **155 activities and events statewide, a 150% increase**
- **Deployed 107 activities to underrepresented educators and students** to address disparities across the system and more than **80% of Playbook grant funding went to schools in high-needs communities**
- Supported both educators and students during the pandemic by providing **64 high-quality virtual STEM programs and experiences**

THE POWER OF PARTNERSHIPS: FEATURED PROGRAMS

INSPIRING CONNECTIONS BETWEEN CLASSROOM AND COMMUNITY

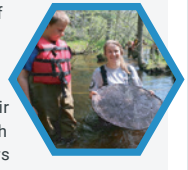
- The Great Lakes Stewardship Initiative (GLSI) connects real experience in the environment with educational approaches that energize and empower students and teachers.
- Several MiSTEM regions worked closely with the GLSI to support infrastructure for 3P instruction, including integration into school improvement plans, teacher professional development and student place-based investigations.
- Through the MiSTEM Advisory Council and the National Oceanic and Atmospheric Administration (NOAA) grants, the partnership is expanding to include after-school and career exploration programming.
- More than 115,000 students have been empowered to help defend and nurture their local environment through this work.

IGNITE THE NEXT GENERATION OF CYBER STARS

- The Western U.P. region partnered with the Michigan Technological University (MTU), the College of Computing Regional Educational Media Center #1 (REMC1), U.P. MiWorks and local teachers to host a one-week, face-to-face GenCyber summer camp in June/July/August.
- The camp will offer hands-on exercises, games and career exploration on cybersecurity and artificial intelligence as AI is redefining every aspect of cybersecurity
- 30 teachers and more than 50 middle and high school students from across the state will participate.

WATERSHED WARRIORS GET THEIR HANDS WET

- MiSTEM Network Region 6 and the Flint River Watershed Coalition partnered with Genesee Intermediate School, Genesee Career Institute and Genesee Opportunity to develop a career exploration camp, one of five piloting this summer.
- Thanks to strong partnership-building efforts in 2021, Genesee County middle schoolers will get the chance to explore the world of environmental science at the region's first Watershed Warriors Laboratory career camp on the Flint River.
- Students will learn the basics of working in a lab, conducting chemical sampling and surveying local residents. They'll also discuss their scientific findings with community members and decision-makers to help improve and protect water quality in the Flint River Watershed.



Charting a Course for Success in Michigan

- Solidify priority metrics for reporting success in alignment with state Sixty by 30 goals and federal STEM goals
- Gain clarity and focus for MiSTEM Network grants that promote equitable access to high-quality 3P STEM learning experiences
- Continue to build strategic partnerships that promote whole community engagement
- Build STEM awareness and connect STEM learning to career pathways

INSPIRING SERVICE

MiSTEM Proposal

Overview of Platform

Inspiring Service has developed a powerful, customizable base platform for "matching" those seeking help and those seeking to help and is working in partnership with the Michigan Community Service Commission (MCSC) to help Michiganders identify ways they can make a difference in their communities and state. The MI Serves platform already has over 2,000 organizations that allow people to search for ways to volunteer with and/or donate to an organization.

Skills Based Volunteer Effort

Inspiring Service has been working with the MCSC over the past two years to develop a skills-based volunteer initiative. There currently are about 500 skilled volunteers offering to support nonprofits in Michigan. Nonprofits will be matched this fall and winter with the volunteers.

volunteers and prospective board members to serve with:

- nonprofits to meet specific needs of their organization
- on government commissions and committees
- on nonprofit boards

The following enhancements have been developed from learnings across these applications:

1. Bi-directional - all parties can search, find, and connect with the others as needs and/or opportunities arise
2. Synchronous and asynchronous - If a current match is not obvious, capture information and interest so parties can be sent an alert when a future match develops.
3. Comprehensive - a robust database of current, upcoming, and anticipated future needs. In addition, a directory capturing interests and capabilities of people with current, upcoming, and future desire to help or fill a position
4. In-person, virtual, and hybrid matching event capabilities
5. Support for multiple and changing representatives seeking people for help or positions
6. Community contributed resource sharing capability

MiSTEM Proposal

To fully meet the needs expressed in one of the key Federal recommendations for strengthening partnerships is to establish a **single, searchable online resource** for finding and funding STEM-related partnerships, activities and funding resources. Inspiring Service has developed a community contributed resource sharing capability and implemented it with the Encore Network and National Alliance for Volunteer Engagement.

Skilled Volunteer Matching Launch

- Cost $10,000 to $20,000 based on current understanding of the needs*

1. Inspiring Service will enter data of MiSTEM schools into MI Serves - this would include the evergreen skilled volunteers needed for each school
2. Work with MiSTEM, the MCSC and other government partners to conduct an outreach to add current volunteers into the platform and recruit new STEM skilled volunteers
3. Provide training to schools to understand how to access the skilled volunteers in the system
4. Track the matching process and submit data to the MiSTEM and to MCSC

Community Resources Sharing and Matching Process

- Cost $10,000 to $20,000 based on current understanding of the needs*

Inspiring Service proposes combining and customizing the matching and resource sharing capabilities to provide the infrastructure needed to propel STEM partnerships among schools, educators, businesses and community leaders.

- Inspiring Service will perform the additional customization to support schools, educators, businesses, and community leaders

Marketing of Platform to Volunteers and Funders

Inspiring Service recommends a marketing budget be established to support the launch of the platform. The Inspiring Service team will work in coordination with the timeline established in the marketing plan to ensure staff are prepared to respond to questions and offer support.

* Costs to be refined with a better understanding of the needs

Scope of Work Plan: Outlining Marketing Tasks and Estimated Investment for Promoting MiSTEM 3P Learning

September 23, 2022

**Estimate tasks, costs/budget to advise MiSTEM Network budget recommendations. This will be refined upon budget approvals by the State of Michigan and official launch meeting is conducted.*

TASK & DELIVERABLES	RESOURCES	EST. COSTS
1. LISTEN, LEARN, LEAD		
Partner Intake Survey • Brief, user-friendly online questionnaire sent by Güd Marketing **Launch Meeting** • Identify and clarify all goals and priorities, define success, exchange relevant information, discuss timing requirements and evaluation metrics **Develop Detailed Work Plan** • Detailed work plan/critical path development schedules, KPI established (requires approval from MiSTEM Network)	Client Services Director Account Manager Account Coordinator Senior Strategist Creative Director Media Manager	$6,500
Campaign Project Management All project management services related to campaign marketing priorities which includes: • Project management and work plan oversight to agreed upon schedules and budgets • Ongoing account management consulting on overall marketing strategies and plans • Oversight and management of public relations, owned media and digital teams, reports and questions	Client Services Director Account Manager Account Coordinator	$50,000
Value Received: • Conference report including all agreements made, summary of any short-term communication needs and a detailed work plan of agency and MiSTEM Network's scheduled tasks, timing and approximate budgets		
	EST. COST	**$56,500**

Secondary Research • Review available data to deepen understanding of goals and key audiences • Full analysis of similar campaigns nationwide • Identify audience segments, trends, opportunities, and continued evolution **Media Analysis** • Audience consumption analysis for media markets	Senior Strategist Research Analyst Account Manager	$5,000
Value Received: • Development of a strategic direction; creation of clear, concise messaging direction; drafting of a comprehensive campaign brief to launch agency team on solutions. This helps us determine and develop advertising opportunities that target MiSTEM Network identified audiences in an effective way.		
	EST. COST	**$5,000**
3. UNCOVER SOLUTIONS		
Develop Advertising Campaign Plan • Create a unique-to-you advertising campaign plan to promote MiSTEM Network priorities and programs; advertising opportunities or campaign opportunities that target our identified audience and fit within the budget • Campaign plan includes final target audience groups identification, definition and messaging recommendations; strategy recommendations for campaign theme, paid media (digital, radio, outdoor, PSA's, etc. and sponsorship) plans, owned media (social, website, etc.), earned media (content management, partnerships, interviews, etc.) and any other recommendations that emerge during the launch and insights tasks	Account Manager Senior Strategist Media Manager Public Relations Manager Owned Media Manager	$15,000
Creative Concepts: Ideas are formed and evaluated based on client-approved campaign brief and creative concepts are reviewed by team. Creation of the big idea/campaign direction is formulized.	Creative Director (16) Art Director (30) Writer (24) Graphic Artist	$20,000
Value Received: • Comprehensive advertising campaign plan with messaging framework including diversity and inclusion considerations; paid, earned and owned media plan framework; along with key timing and budget allocation recommendations; creative concept		
	EST. COST	**$35,000**

4. IGNITE CHANGE		
Development and Implementation of Advertising Campaign • Develop and implement an advertising campaign **Advertising Creative Development** • Determine and develop advertising opportunities • Develop and produce all assets required to implement the Campaign Plan described above, including creative assets such as design and copywriting, content marketing, brand and internal communication assets, presentations, social media posts and paid placements, digital advertisements, fliers, signs, brochures, reports; and public relations tools such as content calendars, newsletter mastheads, templates, etc.	Account Manager Senior Strategist Creative Director Art Director Copywriter	$290,000
Paid Media • Media schedule including flight dates, geographic markets, media weight, messages, and advertising vehicles for campaign • Negotiation and scheduling with all media partners	*N/A - outside cost that represents paid media investment for campaign*	$850,000
Earned Media • Identification of unique angles and stories based on goals and audience; identified in campaign plan • Active pitching of stories to media outlets and reporters who have shown interest in education and literacy • Connect partner activities to campaign messaging; development of earned activity schedule supporting paid media efforts • Conduct partnership outreach with identified partners	Account Manager Public Relations Manager Public Relations Coordinator Copywriter	$65,000

Owned Media • Organic social media strategy and schedule to support and reinforce other ads • Identification and coordination of influencers (as applicable)	Account Manager Owned Media Manager Digital Media Specialist Copywriter	$85,000
Campaign is activated and audience engaged — right message gets to the right people at the right place and at the right time. •Social: Content creation, scheduling and engagement on social platforms. •Digital: Content creation and scheduling for audience engagement with tactics that could include digital video, interactive display ads, audio content targeting on podcasts and in-home streaming services on Pandora and Spotify and paid search with keywords and phrases in premium positions •New Media: Partner with relevant influencers on Instagram who have access to high-reaching audiences who can extend messages. •Partners activated and materials shared.	Creative Director Digital Specialist Graphic Designer Writer/Editor Production Coordinator	$95,000
Value Received: • Development and execution of advertising campaign • Development of all deliverables associated with the advertising campaign • Earned media deliverables outlined in plan • Owned media support to extend engagement and support paid media plan		
	EST. COST	**$1,385,000**
5. MEANINGFUL, MEASURABLE IMPACT		
Ongoing monitoring and optimizing of the campaign, providing relevant data in monthly reporting, and shared through online platform.	Strategy coordinator Digital Specialist	$10,000
Campaign Success Report • *Analysis of advertising components and our set goals, which includes performance outcomes that show effectiveness*	Account Manager Senior Strategist Media Manager Public Relations Manager Owned Media Manager	$8,500
Value Received: • Comprehensive impact report, outlining metrics, performance results, campaign insights and recommendations for next steps		
	EST. COST	**$18,500**

Total Campaign Budget : $1,500,000

MiSTEM Network

Public Awareness Survey Findings Report

May 2022

GVD FOR THE GREATER

emicity

Overview

MiSTEM Network

Background and Research Objectives

MiSTEM Network is working with Güd Marketing to develop a **baseline measure of Michigan's current "culture of STEM"** that will allow for tracking in future years.

Güd Marketing partnered with Emicity to survey Michigan residents to aid in the assessment of public awareness and attitudes toward STEM in Michigan in order **to support the council's work to "change how Michiganders think about STEM."**

MiSTEM Network

Research Objectives

There were four primary topics of this study:

- Assess aided and unaided **awareness of STEM**
- Determine Michiganders' **perception of STEM**
- Identify any **potential barriers** to a greater STEM focus
- Provide geographic **insights to guide STEM-related efforts** by region and demographic factors

MiSTEM Network

Study Methodology

Respondents were screened on the following criteria:

- Age 18 or older
- Michigan residency
- Representative demographic mix (geography, ethnicity, age, income, etc.)
- Parents of K-12 students were intentionally oversampled

MiSTEM Network

Study Methodology

This study consisted of a survey among n=1,302 Michigan residents. To ensure representation across the full range of MiSTEM's geographic hubs, both online (n=1,002) and phone (n=300) versions of the survey were fielded.

The online survey was fielded between April 19 and May 3, 2022, with an average completion time of 12 minutes.

The phone survey was fielded between April 21 and April 29, 2022, with an average completion time of 18.5 minutes.

MiSTEM Network

Notes

- Responses are reported by MiSTEM Hub throughout this report.
  - Sample size for Hub 11 is only 30 responses. Data should be considered directional, not definitive.
  - Hubs 14-16 have been combined into one Upper Peninsula geography.
- Data has been rounded. Charts may not sum to 100% in all instances.

MiSTEM Network

Respondents

MiSTEM Network

n=1,302

Gender	
Male	29%
Female	69%
Nonbinary/Transgender	1%

Age	
18-34	29%
35-49	39%
50+	32%

Education	
Less Than College Graduate	28%
Some College/Associate	23%
Bachelor's+	48%

Income	
<$35K	27%
$35K to $79K	41%
$80K+	26%
Refused	6%

Ethnicity	
Caucasian only	74%
Black/African American	15%
Hispanic/Latino	4%
Asian-American/Pacific Islander	3%
Native American	2%
Middle Eastern	1%

n=1,302

Employment	
Working full time	52%
Working part time	12%
Stay-at-home parent	13%
Student (full or part time)	2%
Retired	11%
Not currently employed	9%

Political Preference	
Very conservative	14%
Somewhat conservative	23%
Central/Centrist	21%
Somewhat liberal	18%
Very liberal	13%
Rather not say	12%

Homeownership	
Own	69%
Rent	31%

Area of Residence	
Urban	19%
Suburban	44%
Rural/Farm	37%

n=1,302

K-12 Parental Status	
Parent	47%
Children enrolled in public school	41%
Non-parent	53%

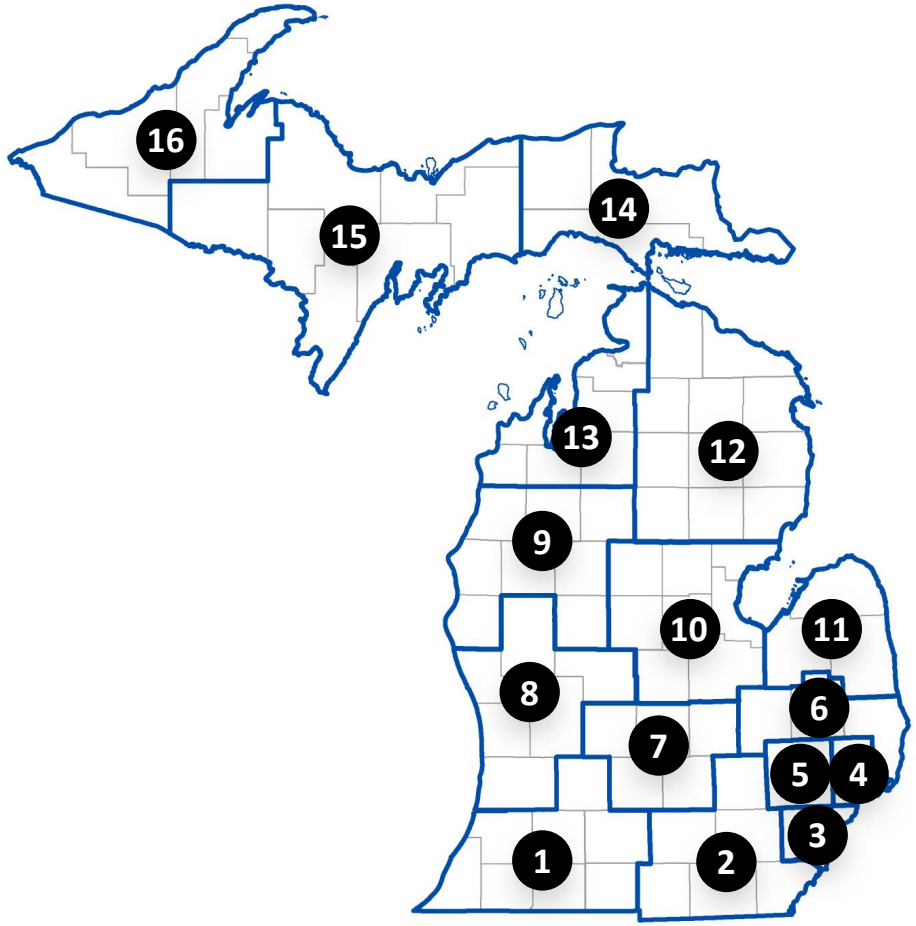
STEM Experience	
Degree in STEM field	16%
Work/worked in STEM job	26%

Age of Children in HH	
Ages 0-5	19%
Ages 6-10	25%
Ages 11-17	30%

MiSTEM Network

Recruitment across hubs was consistent with population, with proportional representation from all of Michigan's 16 hubs.

Hub	% of Sample (n=1,302)
1	8%
2	6%
3	14%
4	6%
5	8%
6	6%
7	7%
8	12%
9	4%
10	12%
11	2%
12	4%
13	5%
14	1%
15	3%
16	1%



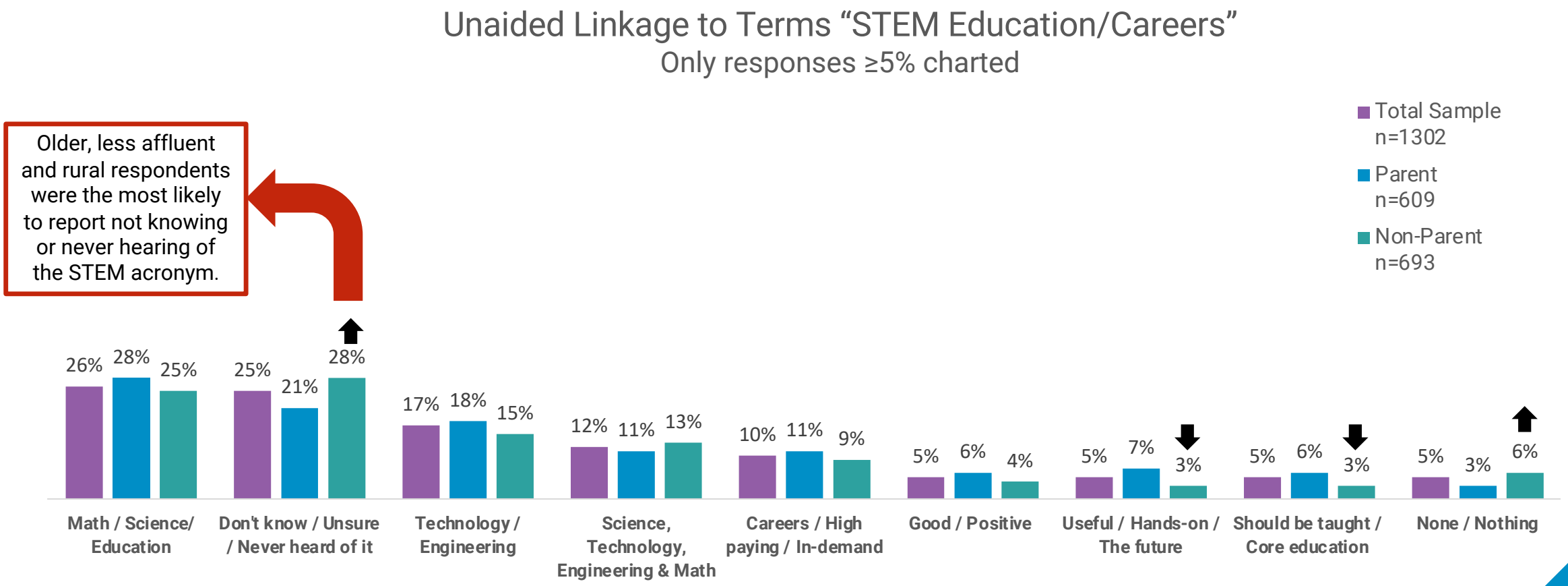
MiSTEM Network

Awareness of STEM

MiSTEM Network

Unaided Awareness of STEM

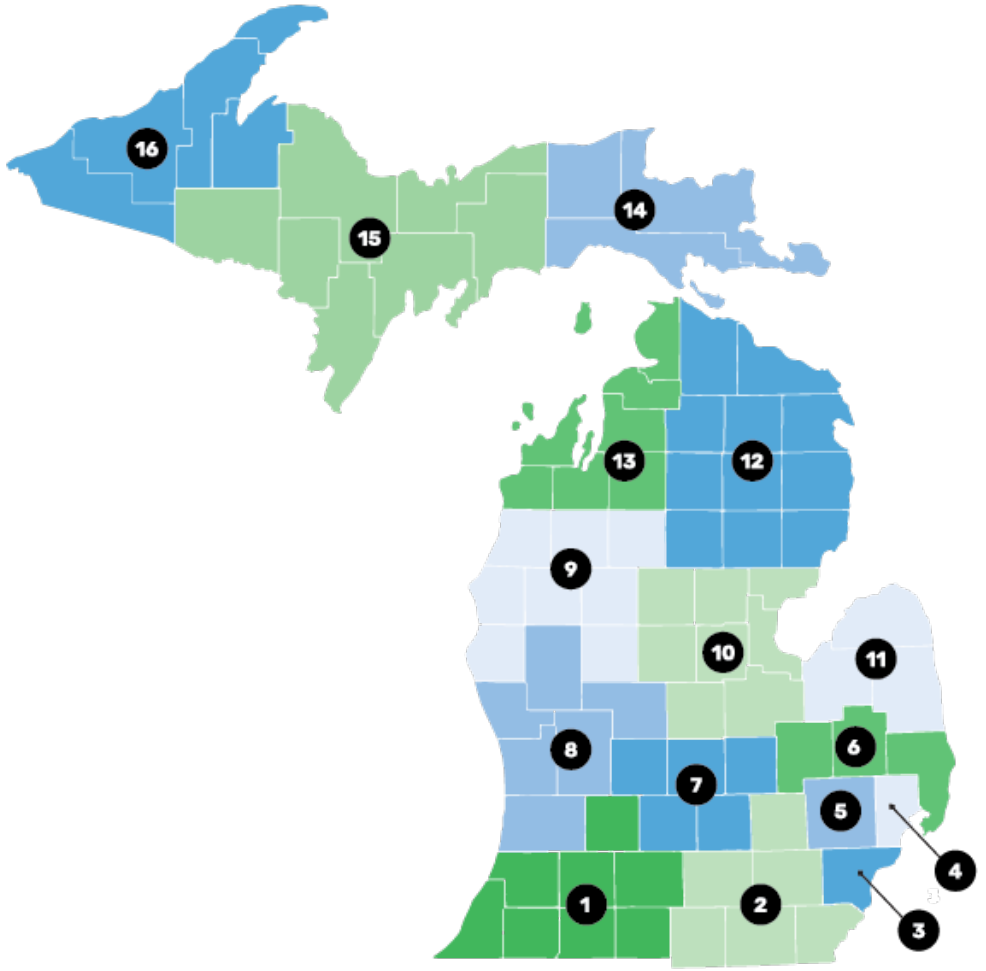
Most Michiganders are at least somewhat familiar with STEM education or careers. Only 25% say they “don’t know.”



Q10: What do you think of when you see the phrases ‘STEM education’ or ‘STEM careers’?

Unaided Awareness by Hub | "Don't Know" or "Not Sure"

Hub	Don't Know/Not Sure
Hub 2 | **S. Cen.**	14%
Hub 6 | **Genesee+**	18%
Hub 4 | **Macomb**	20%
Hub 3 | **Wayne**	21%
Hub 5 | **Oakland**	21%
Hub 7 | **Lansing+**	21%
Hub 8 | **GR+**	23%
Hub 1 | **SW**	27%
Hub 10 | **Tri-Cities**	27%
Hub 12 | **NE**	28%
Hubs 14-16 | **U.P.**	32%
*Hub 11 | **Thumb**	37%
Hub 13 | **NW**	39%
Hub 9 | **Cadillac+**	44%

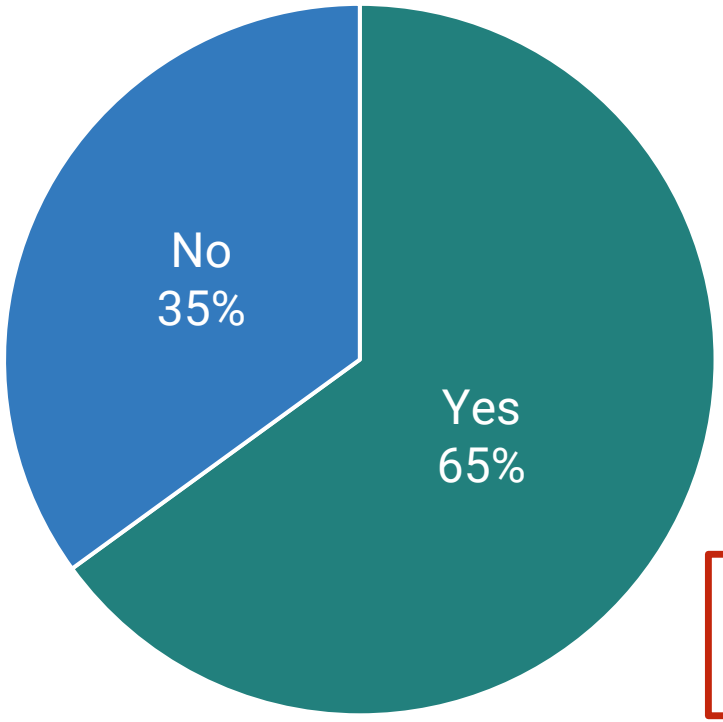


Q10: What do you think of when you see the phrases "STEM education" or "STEM careers"?

Aided Awareness of STEM

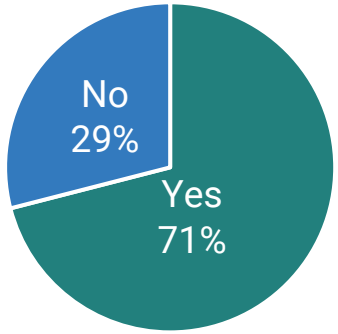
When provided with an explanation of the STEM acronym, two-thirds reported being familiar and 7 in 10 parents were familiar.

Aided Familiarity With STEM Acronym
Total Sample



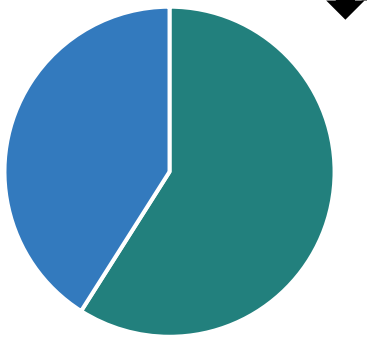
Those with a bachelor's degree+ or from suburban areas were significantly more familiar with the STEM acronym on an aided basis.

Aided Familiarity With STEM Acronym
Parents



Aided Familiarity With STEM Acronym
Non-Parents

= sig. lower/higher than Parents at 90% confidence

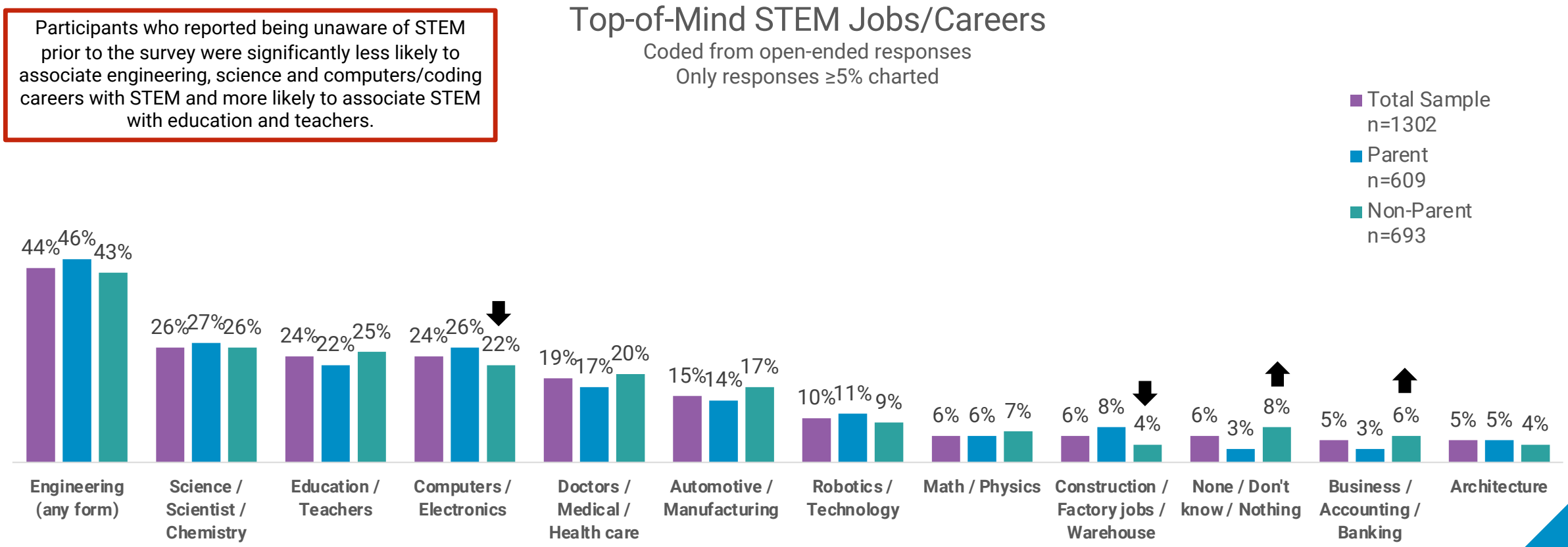


Q11: In case you're not aware, STEM stands for "Science, Technology, Engineering, and Mathematics." Before this survey, were you familiar with this acronym of STEM?

STEM Jobs & Careers

Engineering careers were those most frequently linked to STEM.

Participants who reported being unaware of STEM prior to the survey were significantly less likely to associate engineering, science and computers/coding careers with STEM and more likely to associate STEM with education and teachers.

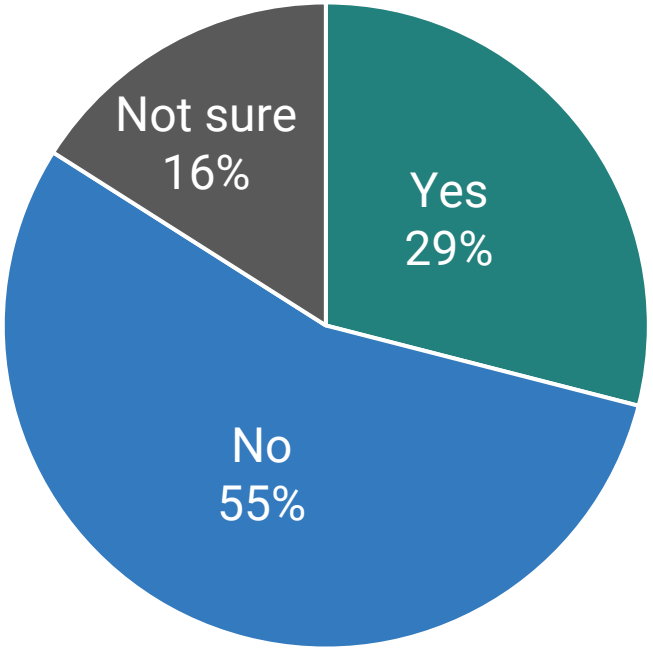


Q12: . In Michigan, when you think of STEM (Science, Technology, Engineering, and Mathematics), what types of jobs or careers come to mind?

STEM Messaging

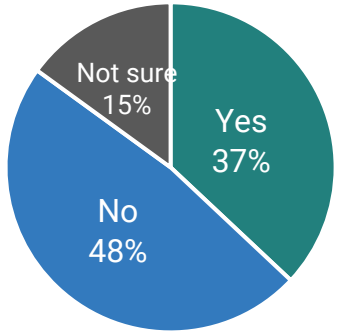
About 3 in 10 respondents recall information about STEM education in the past 90 days. Parents are more likely to recall something than non-parents.

Recall STEM-Related Messaging in Past 90 Days
Total Sample



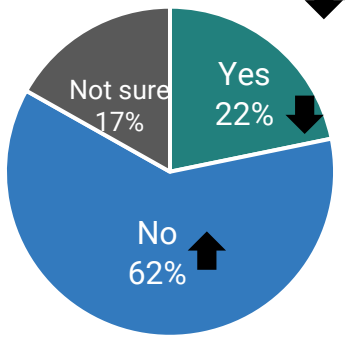
Affluent respondents ($80K+) were the most likely to have recalled seeing recent STEM-related messaging.

Recall STEM-Related Messaging:
Parents



Recall STEM-Related Messaging:
Non-Parents

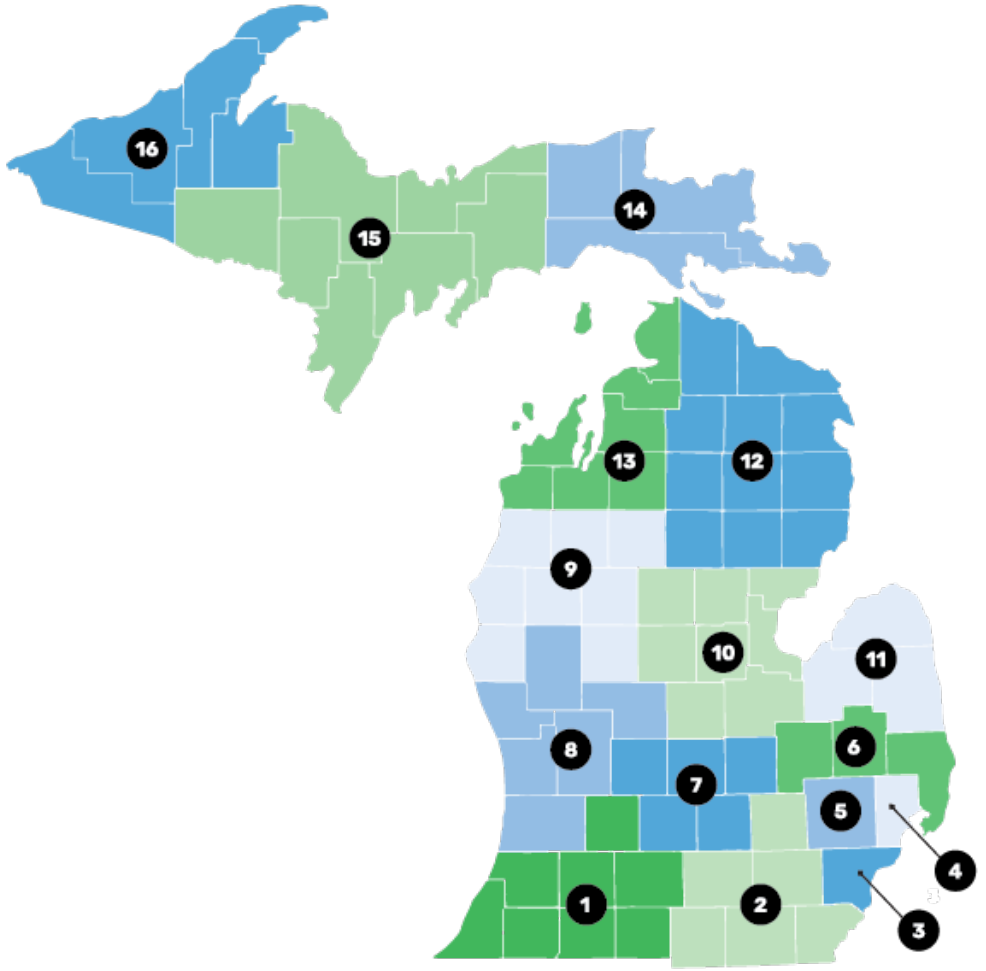
= sig. lower/higher than Parents at 90% confidence



Q13: Within the past three months or so, have you read, heard or seen anything about efforts to improve STEM education in your local area or in Michigan?

Recall | Recall STEM-Related Messaging in Past 90 Days

Hub	Recall STEM-Related Messaging
Hub 8 | **GR+**	34%
Hubs 14-16 | **U.P.**	33%
Hub 2 | **S. Cen.**	33%
Hub 4 | **Macomb**	32%
Hub 3 | **Wayne**	31%
Hub 13 | **NW**	31%
Hub 5 | **Oakland**	29%
Hub 9 | **Cadillac+**	29%
Hub 6 | **Genesee+**	25%
Hub 10 | **Tri-Cities**	25%
Hub 12 | **NE**	24%
Hub 7 | **Lansing+**	24%
Hub 1 | **SW**	24%
*Hub 11 | **Thumb**	20%



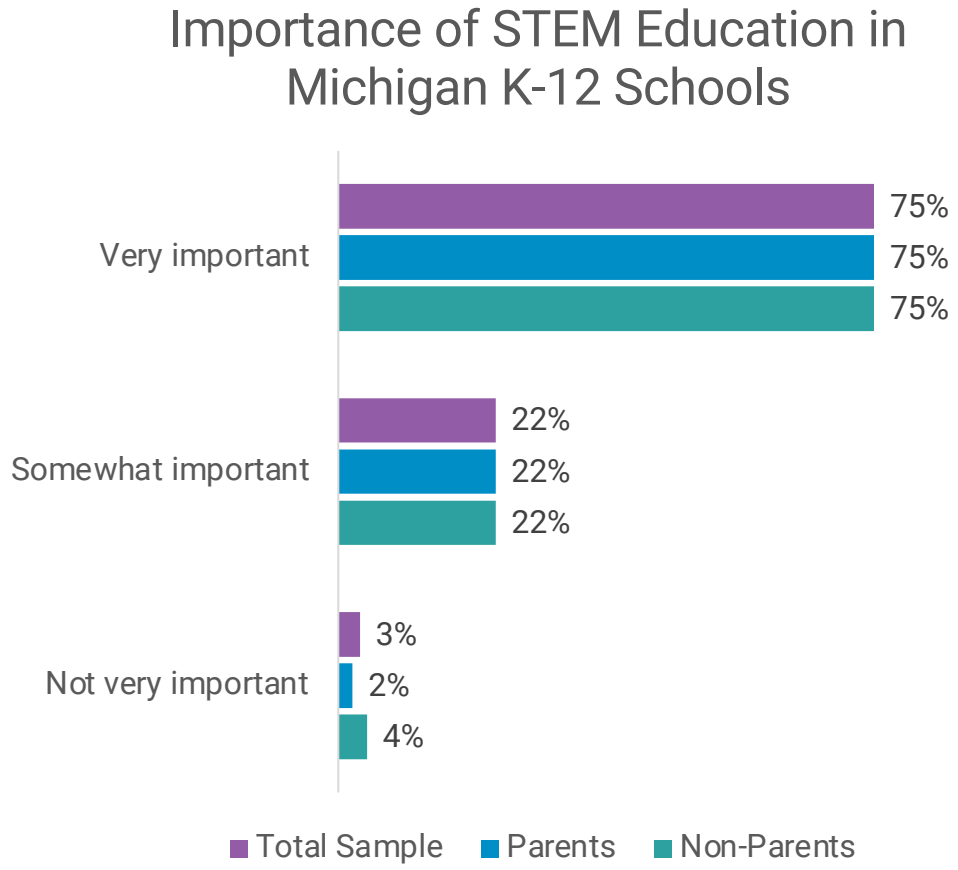
Q13: Within the past three months or so, have you read, heard or seen anything about efforts to improve STEM education in your local area or in Michigan?

Perception of STEM

MiSTEM Network

Importance of K-12 STEM Education

Most Michiganders, regardless of location or parental status, agree that STEM education is very important for K-12 students.



BIPOC (83%) respondents were significantly more likely to indicate that STEM education is “Very important” in the state than white respondents (73%).

Residents of urban areas (80%) were more likely than suburban (74%) and rural (73%) areas to say it’s “Very important.”

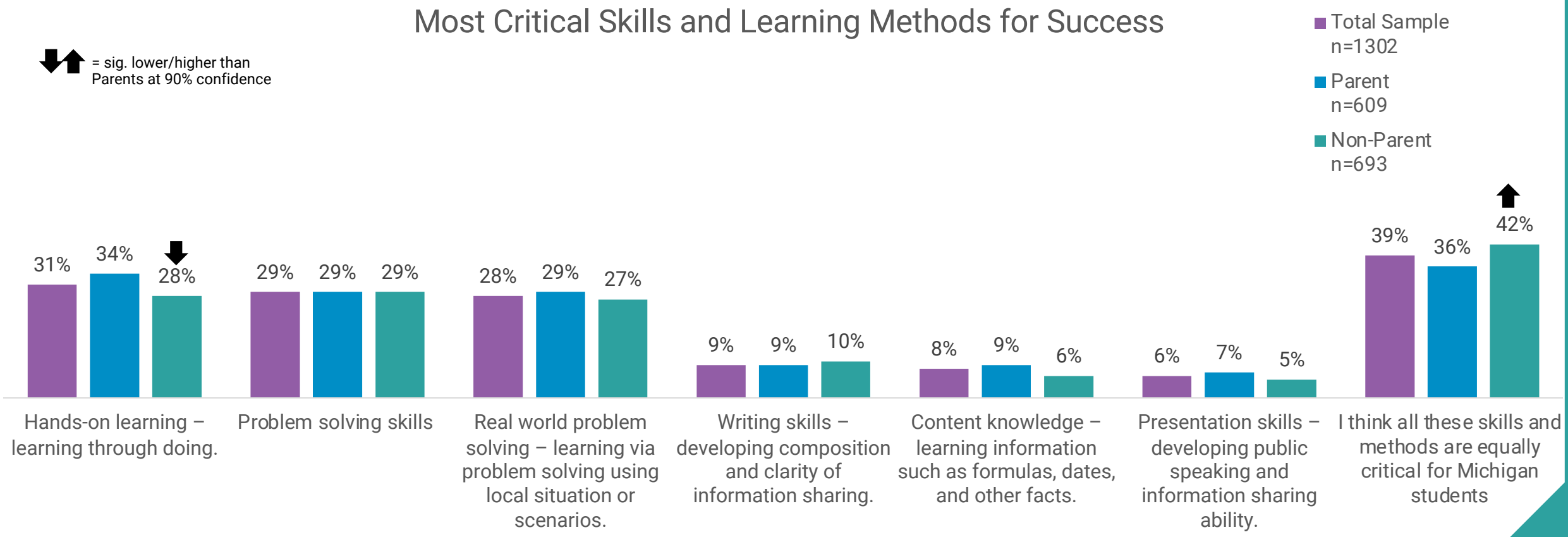
Affluent respondents (earn $80K+; 80%) were more likely than less affluent respondents to indicate that STEM is “Very important.”

= sig. lower/higher than Parents at 90% confidence

Q14: In your opinion, how important is it to improve STEM education in Michigan K-12 schools?

Critical Skills & Learning Methods

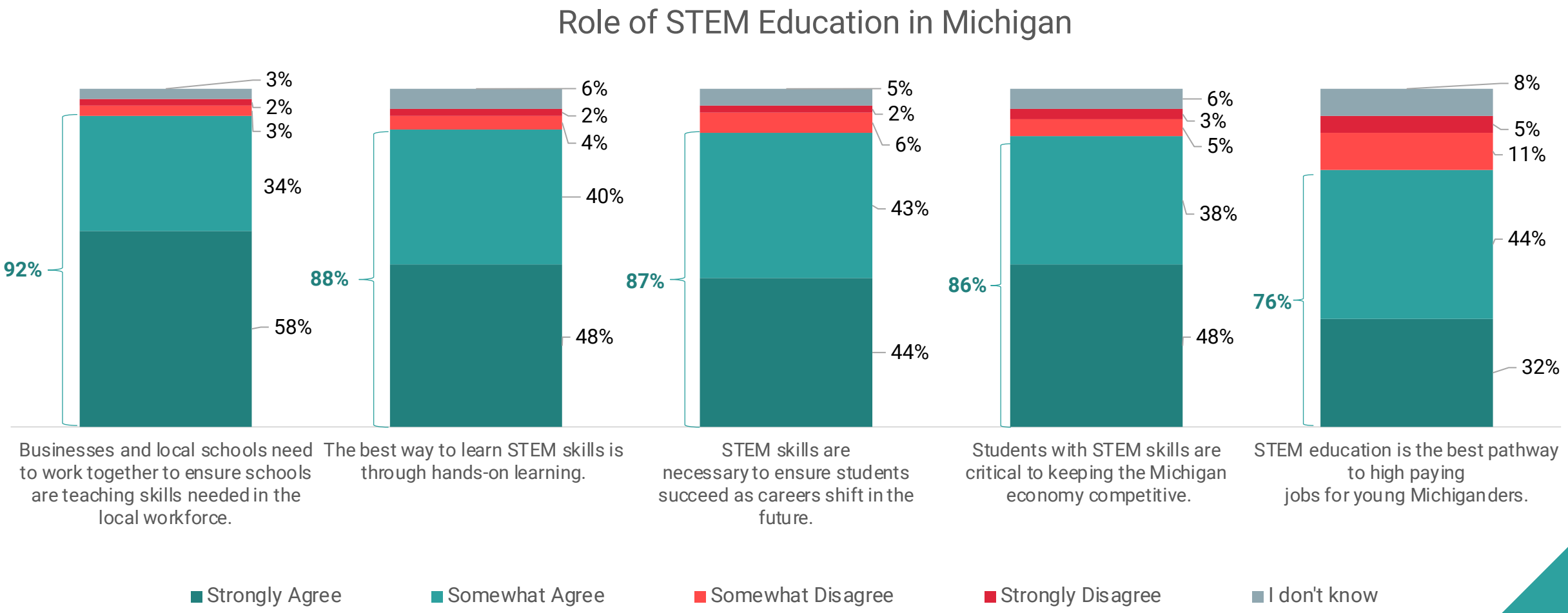
Michiganders generally prioritized learning methods — hands-on instruction, real-world problem-solving — as most crucial to success.



Q15: From your viewpoint, which of the educational skills and learning methods listed below are most critical to helping Michigan K-12 students succeed? Select up to two skills/methods you feel are most important.

Role of STEM Education

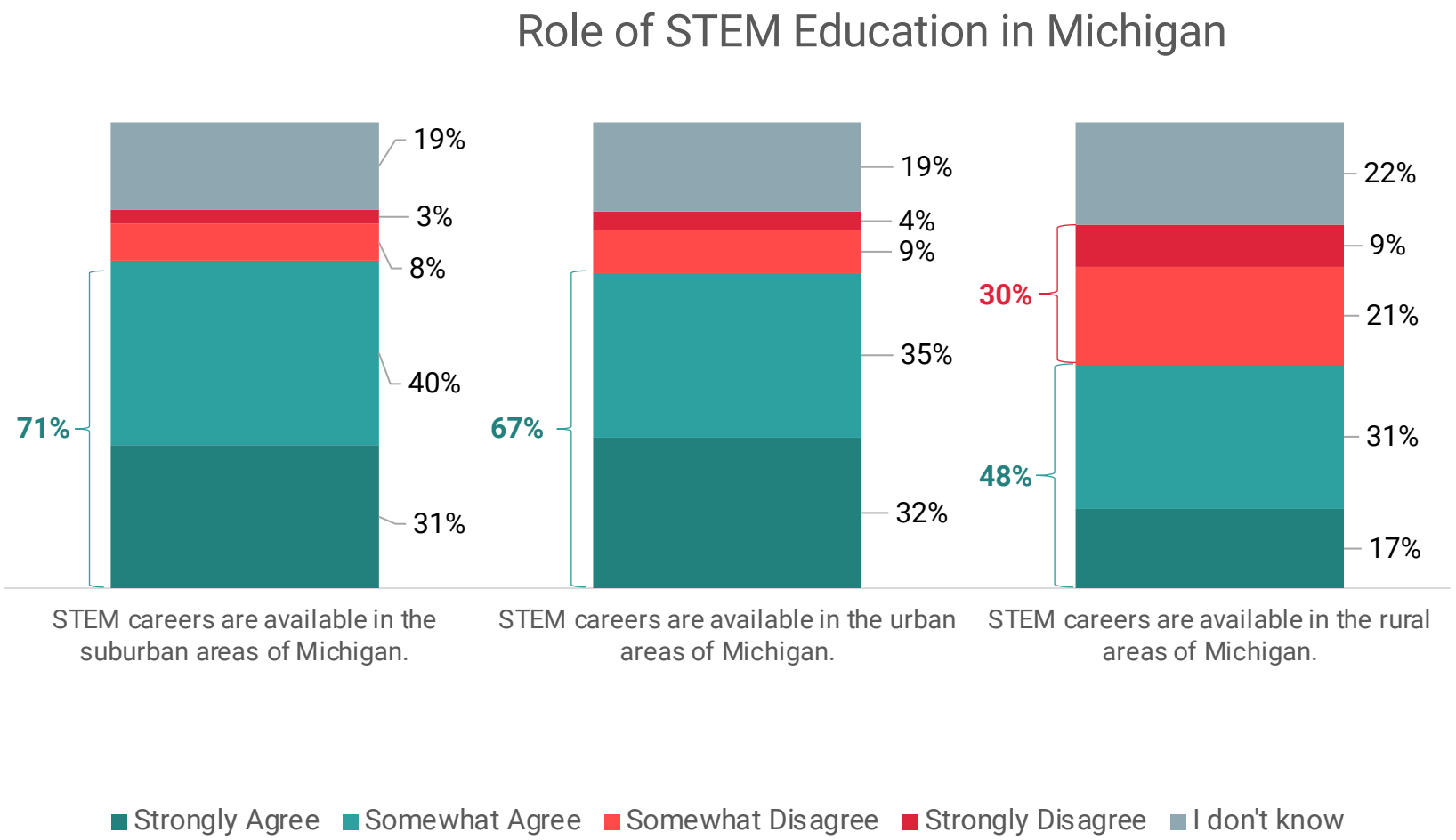
Michiganders value education/business partnerships, hands-on learning and skills needed for a high-paying career.



Q16: The next questions are about your thoughts regarding the role of STEM education in Michigan. How much do you agree or disagree with each statement below?

Location of STEM Careers

STEM jobs were perceived as being concentrated in urban and suburban areas, with fewer STEM opportunities in rural communities.



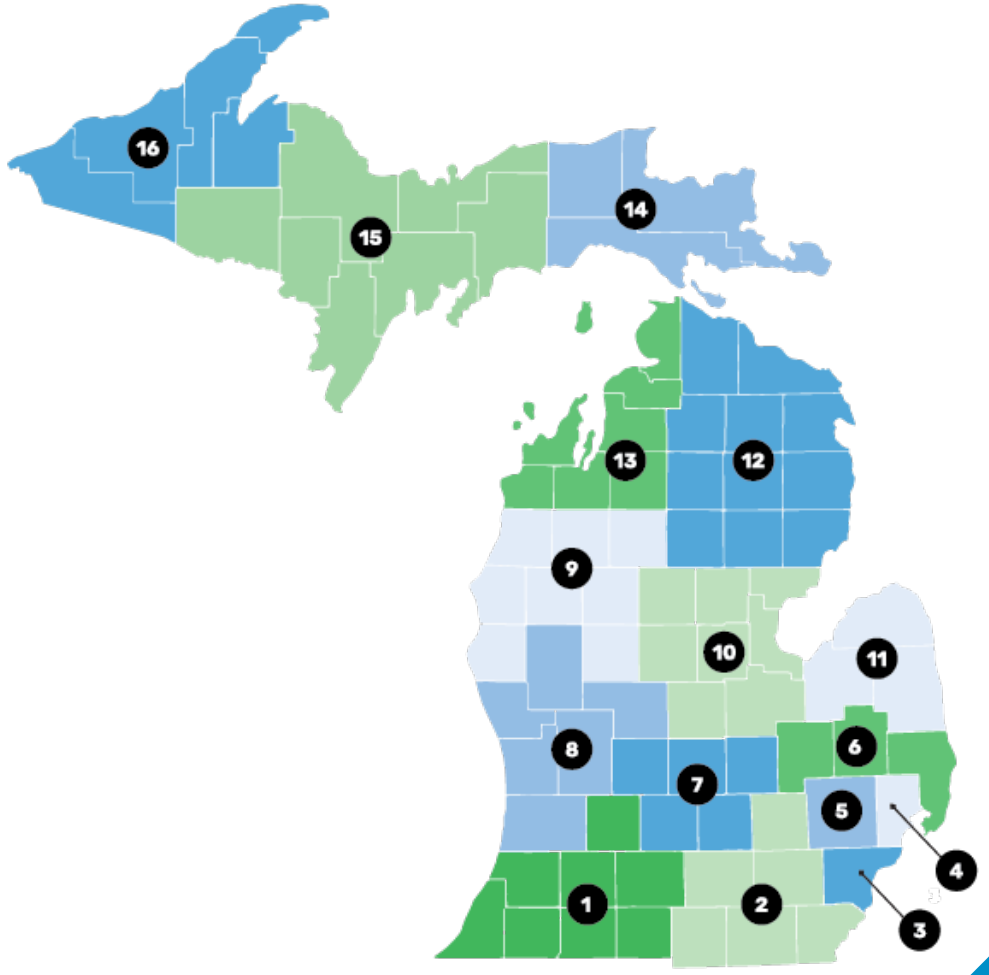
Residents of urban areas were most likely to agree STEM jobs are available in urban (68%), suburban (75%) and rural (58%) areas of Michigan.

Rural residents were significantly less likely to say STEM jobs were available in suburban (66%) and rural (47%) areas.

Q16: The next questions are about your thoughts regarding the role of STEM education in Michigan. How much do you agree or disagree with each statement below?

Agreement | STEM careers are available in rural areas

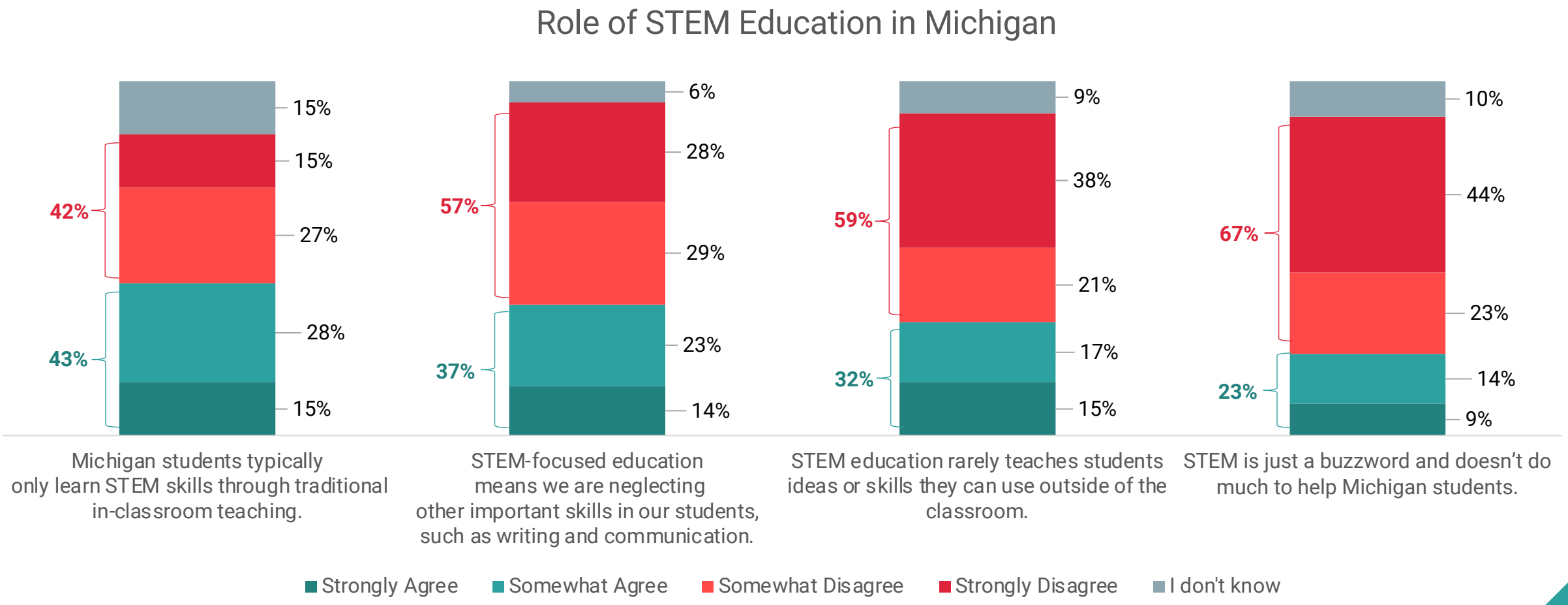
Hub	Agree — Rural STEM Jobs Available
Hub 8 | **GR+**	55%
*Hub 11 | **Thumb**	53%
Hub 3 | **Wayne**	53%
Hub 5 | **Oakland**	52%
Hubs 14-16 | **U.P.**	52%
Hub 6 | **Genesee+**	52%
Hub 4 | **Macomb**	49%
Hub 2 | **S. Cen.**	49%
Hub 9 | **Cadillac+**	45%
Hub 10 | **Tri-Cities**	45%
Hub 1 | **SW**	42%
Hub 12 | **NE**	37%
Hub 7 | **Lansing+**	36%
Hub 13 | **NW**	29%



Q16: The next questions are about your thoughts regarding the role of STEM education in Michigan. How much do you agree or disagree with each statement below? STEM careers are available in the rural areas of Michigan.

Perceptions of STEM Learning

Over a third of respondents reported that having a STEM-focused education is at the detriment to other important skills like writing and communication. Further, a sizable number of Michiganders think that STEM skills are taught only through traditional in-classroom techniques, indicating one focal area for education efforts.



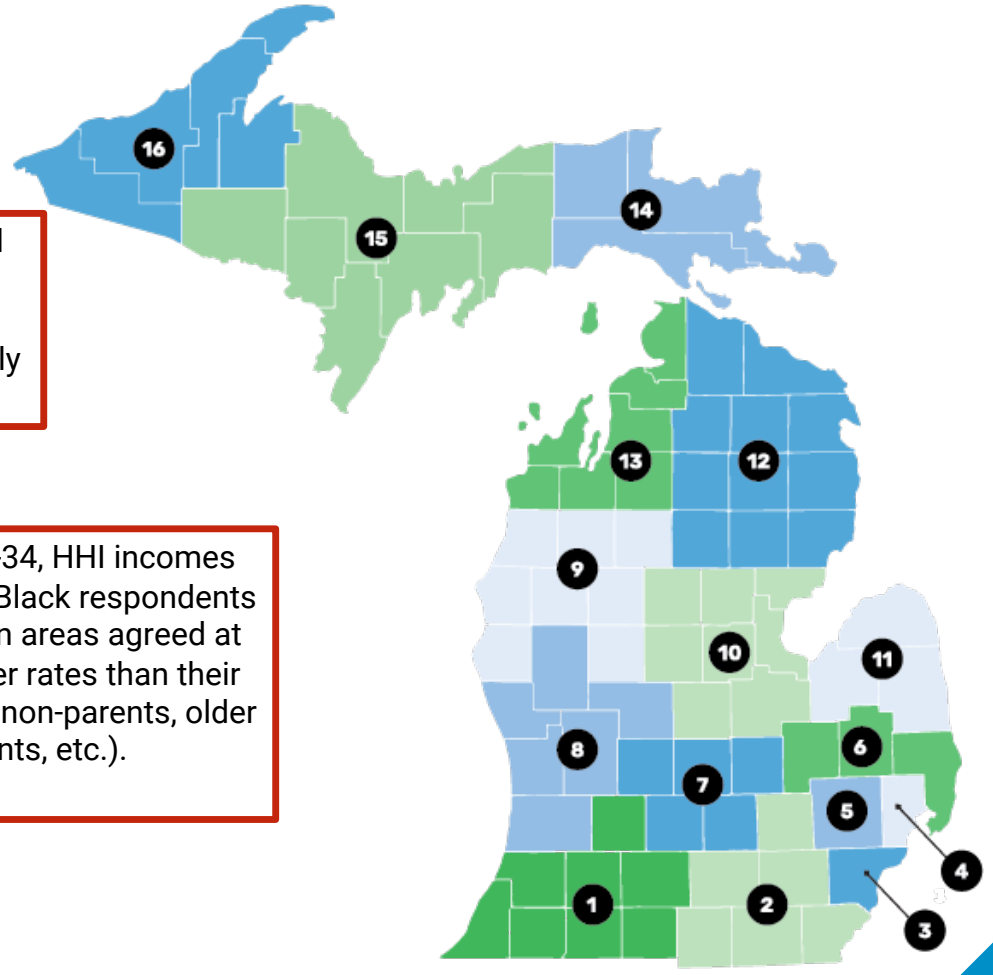
Q16: The next questions are about your thoughts regarding the role of STEM education in Michigan. How much do you agree or disagree with each statement below?

Agreement | Michigan students typically learn STEM skills only through traditional in-classroom teaching.

Hub	Agree — Michigan students learn STEM skills only in traditional in-classroom teaching
Hub 3 | **Wayne**	54%
Hub 6 | **Genesee+**	52%
Hub 5 | **Oakland**	50%
*Hub 11 | **Thumb**	50%
Hub 4 | **Macomb**	45%
Hub 2 | **S. Cen.**	42%
Hub 1 | **SW**	42%
Hub 9 | **Cadillac+**	40%
Hub 7 | **Lansing+**	38%
Hub 8 | **GR+**	38%
Hub 10 | **Tri-Cities**	37%
Hub 12 | **NE**	37%
Hub 13 | **NW**	34%
Hubs 14-16 | **U.P.**	34%

Metro Detroit and Flint are far more likely to believe STEM is taught only in classroom.

Parents, ages 18-34, HHI incomes below $35K, men, Black respondents and those in urban areas agreed at significantly higher rates than their counterparts (e.g., non-parents, older respondents, etc.).

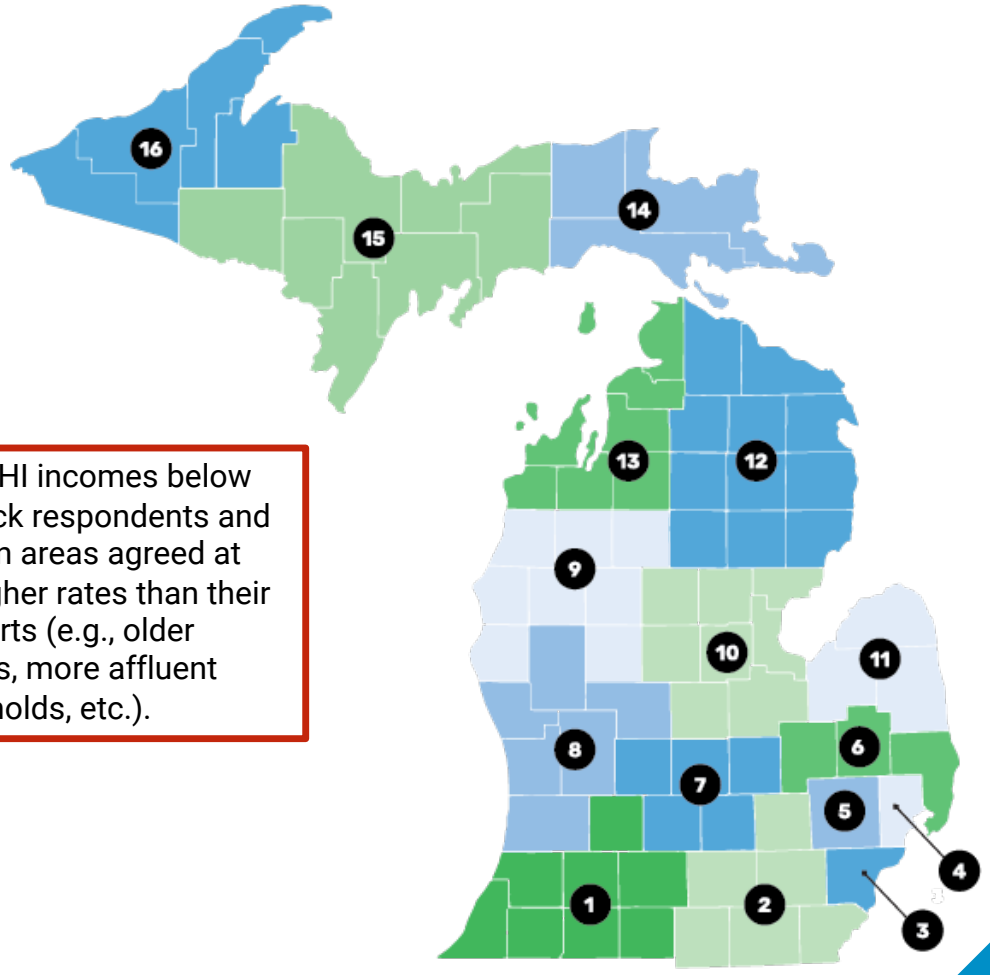


Q13: Within the past three months or so, have you read, heard or seen anything about efforts to improve STEM education in your local area or in Michigan? Michigan students typically only learn STEM skills through traditional in-classroom teaching.

Agreement | STEM-focused education means we are neglecting other important skills in our students, such as writing and communication.

Hub	Agree — STEM-focused ed means neglecting other skills like writing and communications
*Hub 11 | **Thumb**	53%
Hub 3 | **Wayne**	49%
Hub 13 | **NW**	41%
Hub 5 | **Oakland**	40%
Hub 2 | **S. Cen.**	40%
Hub 9 | **Cadillac+**	38%
Hub 4 | **Macomb**	36%
Hub 10 | **Tri-Cities**	36%
Hub 6 | **Genesee+**	35%
Hub 8 | **GR+**	33%
Hubs 14-16 | **U.P.**	33%
Hub 12 | **NE**	33%
Hub 1 | **SW**	31%
Hub 7 | **Lansing+**	28%

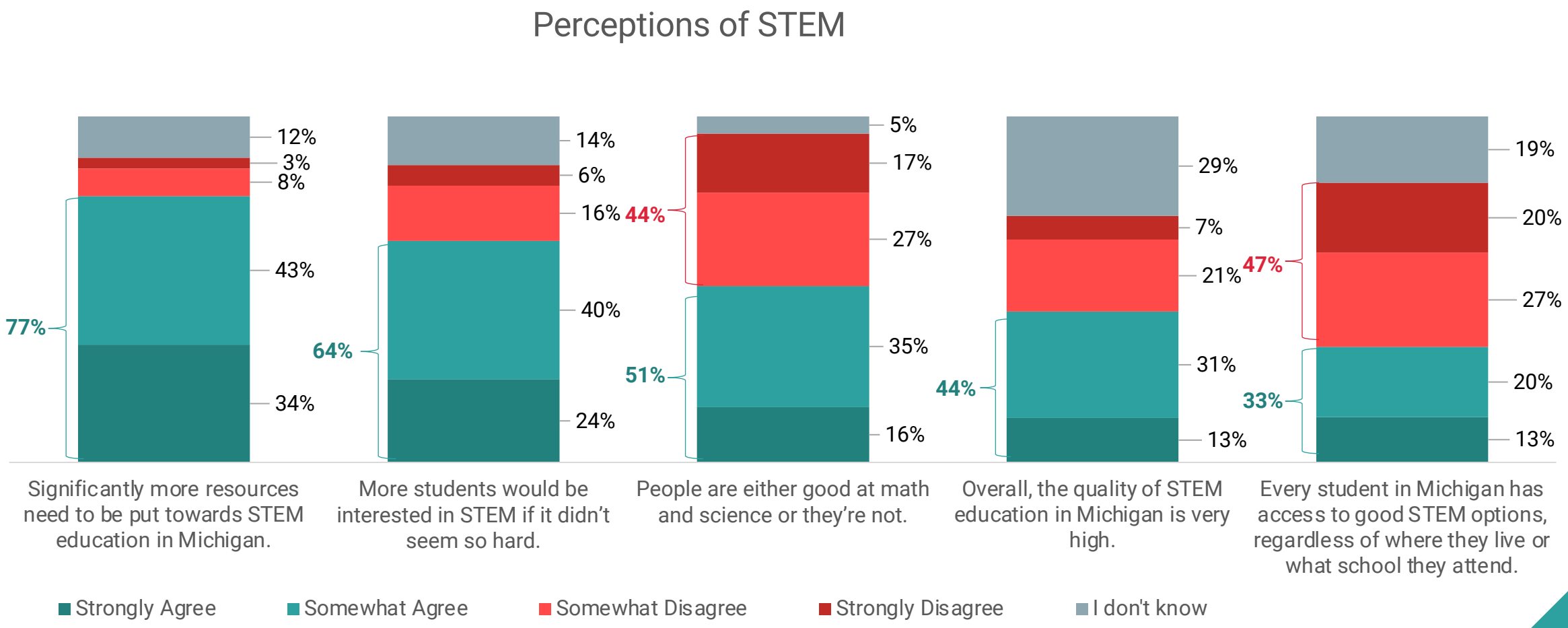
Ages 18-34, HHI incomes below $35K, men, Black respondents and those in urban areas agreed at significantly higher rates than their counterparts (e.g., older respondents, more affluent households, etc.).



Q13: Within the past three months or so, have you read, heard or seen anything about efforts to improve STEM education in your local area or in Michigan? STEM-focused education means we are neglecting other important skills in our students, such as writing and communication.

Perceptions of STEM Learning

Michiganders support investment in STEM but also believe it to be hard and/or only for students with a disposition for math and science.

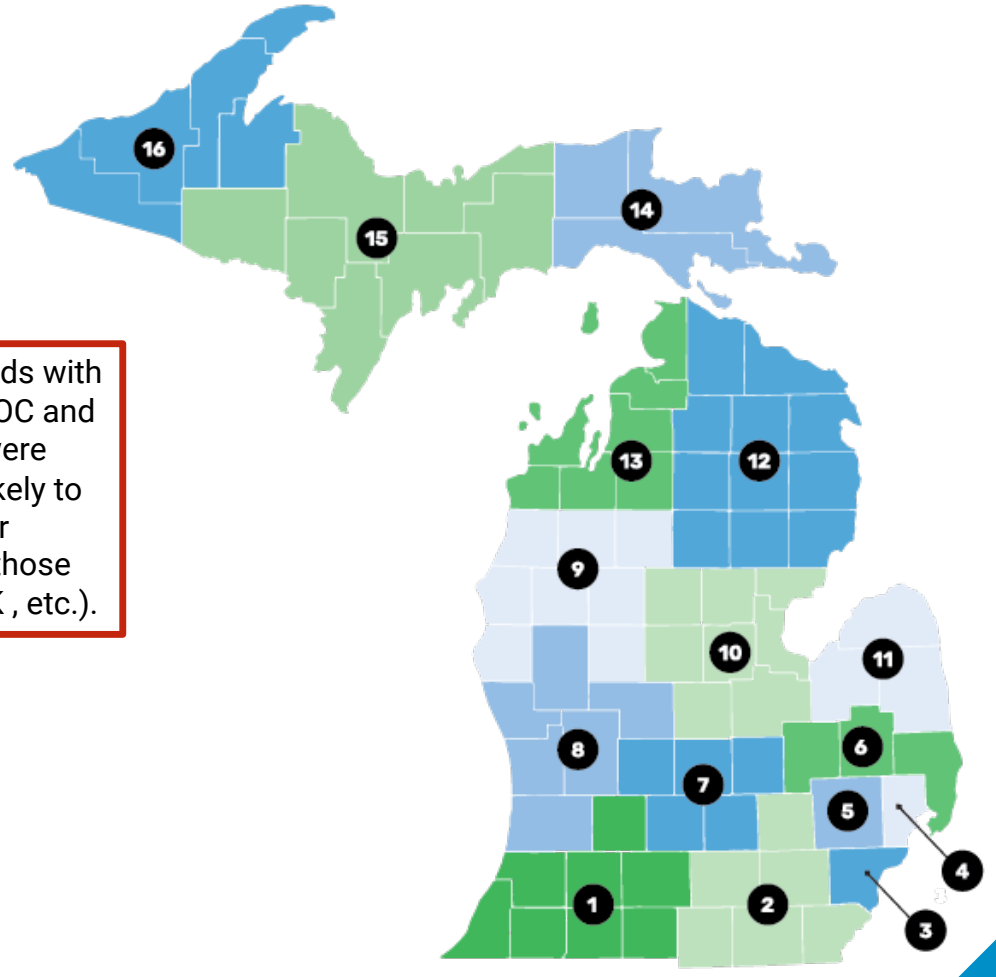


Q17: Here's another short list of statements about STEM, this time focused on different groups of people who participate in STEM education and careers. Again, how much do you agree or disagree with each statement below?

Agreement | People are either good at math and science or they're not.

Hub	Agree — People are either good at math and science or they're not.
Hub 3 | **Wayne**	60%
Hub 8 | **GR+**	57%
Hub 9 | **Cadillac+**	56%
Hub 6 | **Genesee+**	54%
Hub 4 | **Macomb**	52%
Hub 2 | **S. Cen.**	51%
Hub 7 | **Lansing+**	51%
Hub 5 | **Oakland**	50%
*Hub 11 | **Thumb**	50%
Hub 1 | **SW**	48%
Hub 10 | **Tri-Cities**	47%
Hub 13 | **NW**	42%
Hubs 14-16 | **U.P.**	38%
Hub 12 | **NE**	37%

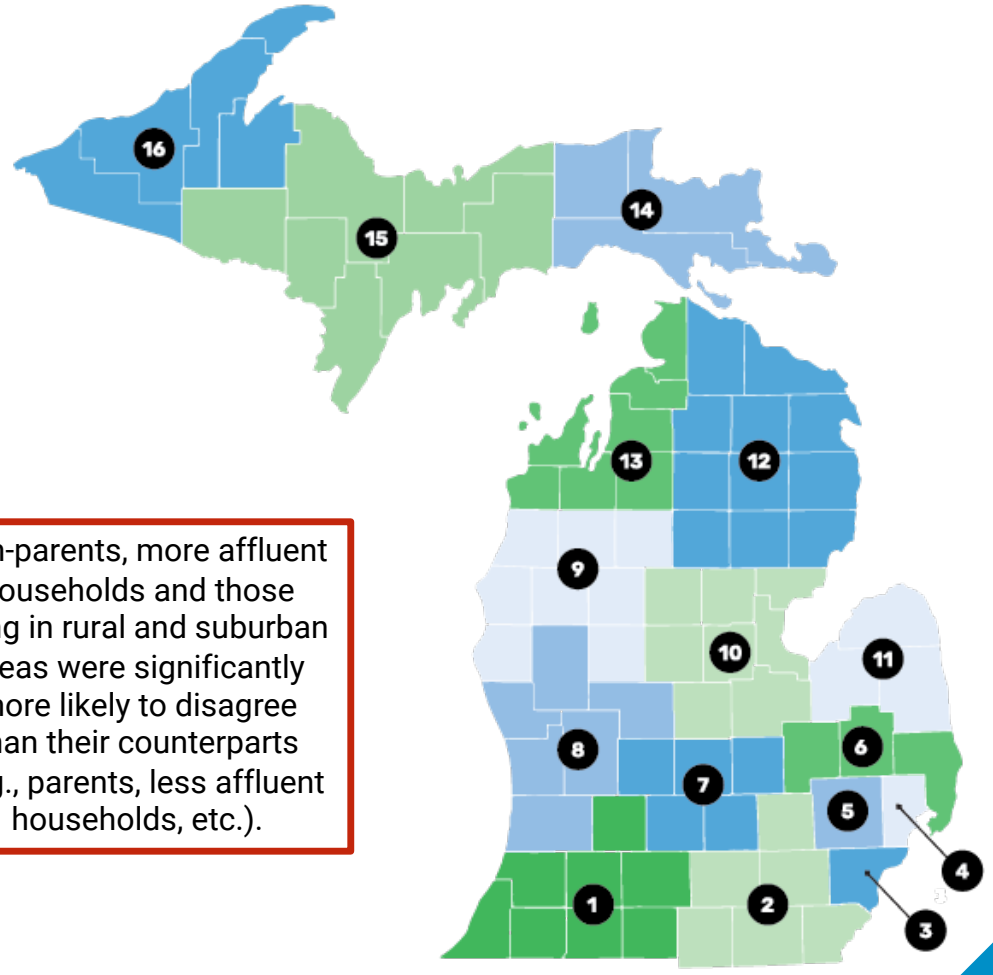
Ages 18-34, households with incomes <$80K, BIPOC and urban residents were significantly more likely to agree than their counterparts (e.g., those ages 35+, HHI > $80K , etc.).



Q17: Here's another short list of statements about STEM, this time focused on different groups of people who participate in STEM education and careers. Again, how much do you agree or disagree with each statement below?

Disagreement | Every student in Michigan has access to good STEM options, regardless of where they live or what school they attend.

Hub	Disagree — Every student in Michigan has access to good STEM options, regardless of where they live or what school they attend
Hubs 14-16 | **U.P.**	62%
Hub 2 | **S. Cen.**	58%
Hub 12 | **NE**	57%
Hub 9 | **Cadillac+**	56%
Hub 7 | **Lansing+**	55%
Hub 13 | **NW**	53%
Hub 10 | **Tri-Cities**	47%
*Hub 11 | **Thumb**	47%
Hub 3 | **Wayne**	45%
Hub 1 | **SW**	43%
Hub 4 | **Macomb**	43%
Hub 6 | **Genesee+**	42%
Hub 8 | **GR+**	40%
Hub 5 | **Oakland**	38%

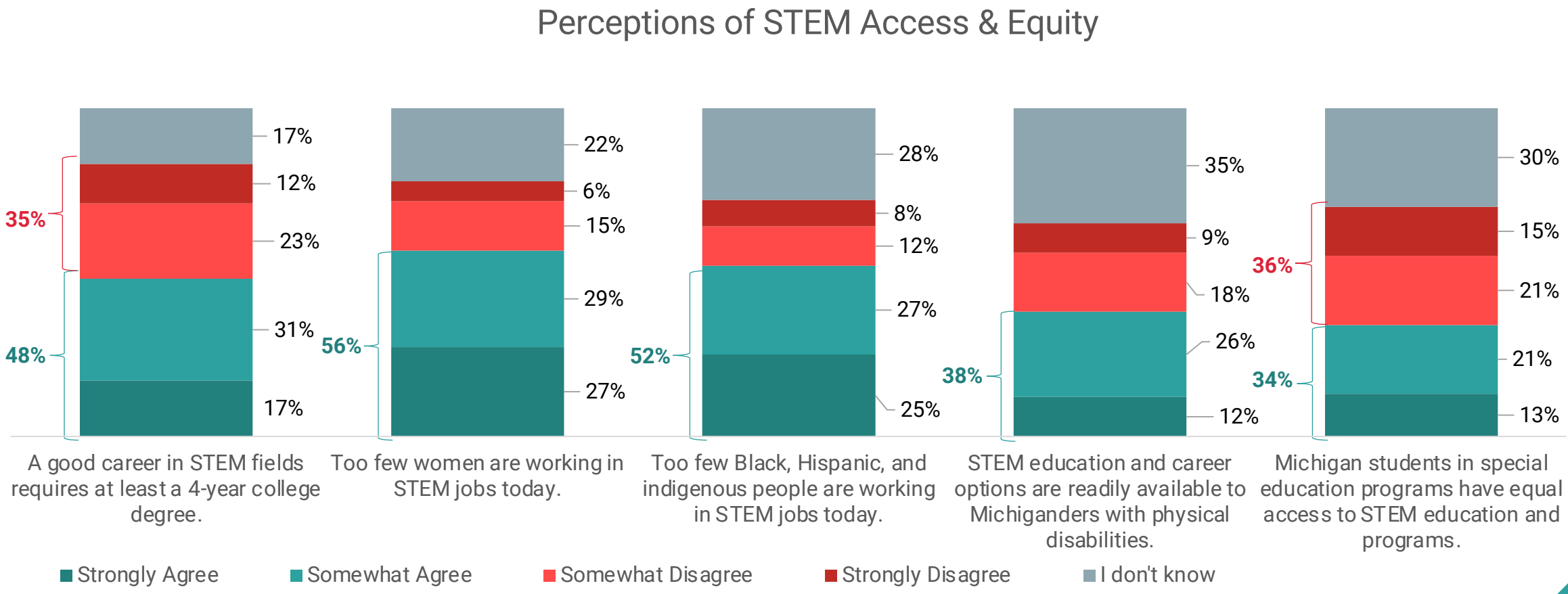


Non-parents, more affluent households and those living in rural and suburban areas were significantly more likely to disagree than their counterparts (e.g., parents, less affluent households, etc.).

Q17: Here's another short list of statements about STEM, this time focused on different groups of people who participate in STEM education and careers. Again, how much do you agree or disagree with each statement below?

STEM Education Access

A majority of Michiganders agree too few women and BIPOC individuals work in STEM. Many respondents weren't sure for women and BIPOC or what opportunities exist for individuals with disabilities.

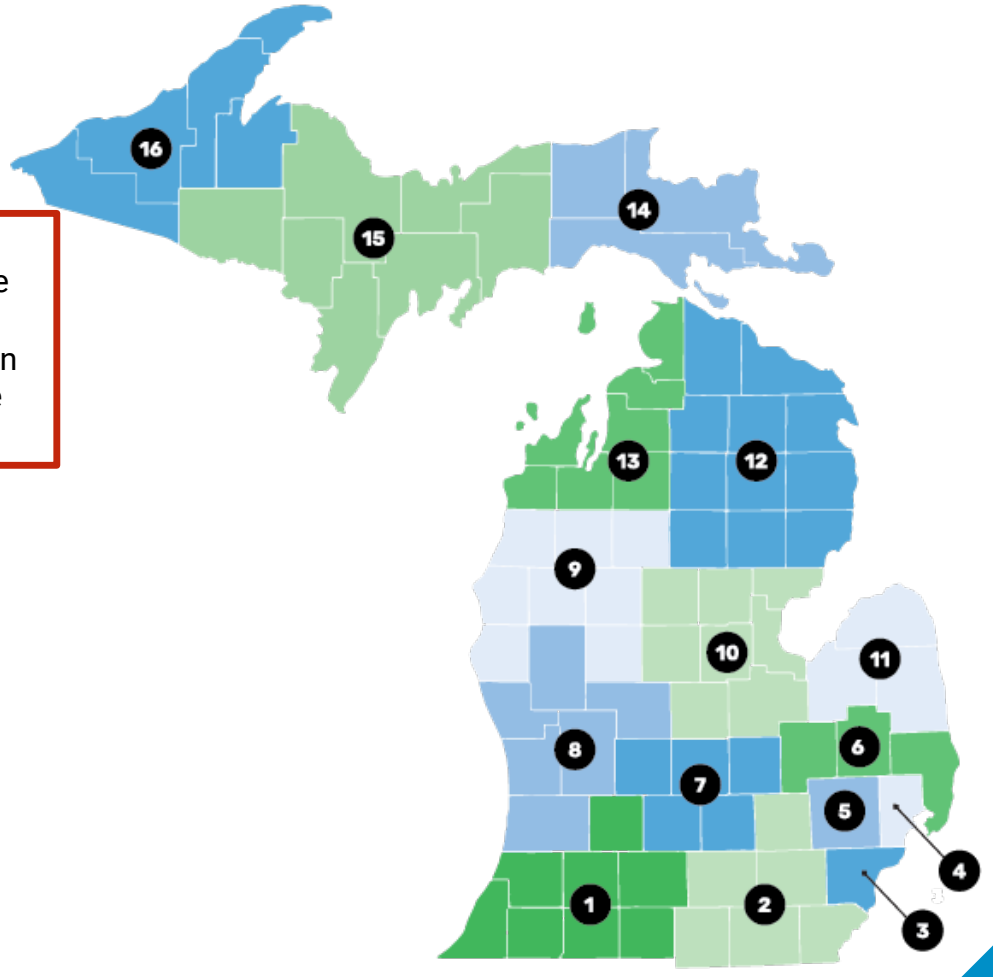


Q17: Here's another short list of statements about STEM, this time focused on different groups of people who participate in STEM education and careers. Again, how much do you agree or disagree with each statement below?

Agreement | A good career in STEM fields requires at least a 4-year college degree.

Hub	Agree — A good career in STEM fields requires at least a 4-year college degree.
Hub 5 | **Oakland**	63%
Hub 3 | **Wayne**	60%
Hub 4 | **Macomb**	56%
Hub 2 | **S. Cen.**	48%
Hub 8 | **GR+**	48%
Hub 10 | **Tri-Cities**	45%
Hub 6 | **Genesee+**	44%
Hub 7 | **Lansing+**	40%
Hub 1 | **SW**	40%
Hub 12 | **NE**	41%
Hub 13 | **NW**	39%
Hub 9 | **Cadillac+**	38%
Hubs 14-16 | **U.P.**	38%
*Hub 11 | **Thumb**	30%

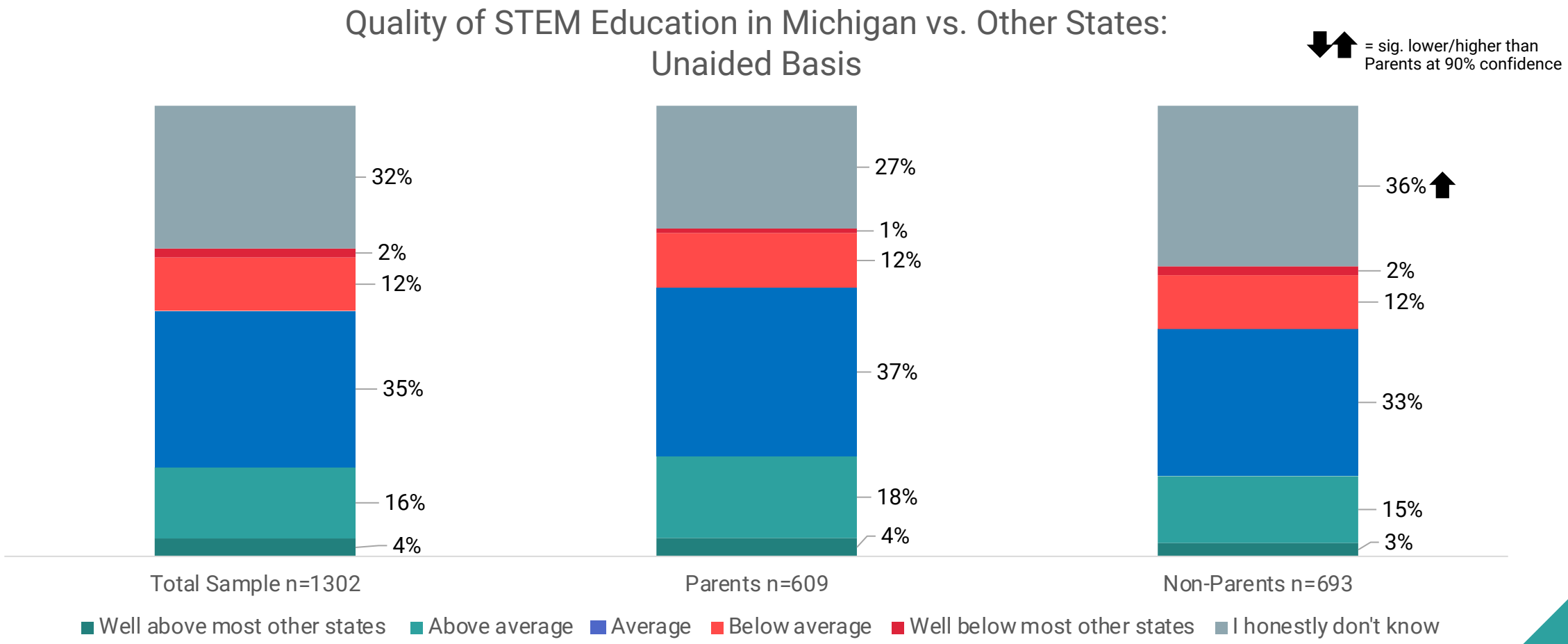
Metro Detroit is far more likely to agree than other regions. Suburban and urban locales agree more than rural areas.



Q17: Here's another short list of statements about STEM, this time focused on different groups of people who participate in STEM education and careers. Again, how much do you agree or disagree with each statement below?

Unaided | Quality of Michigan STEM Education

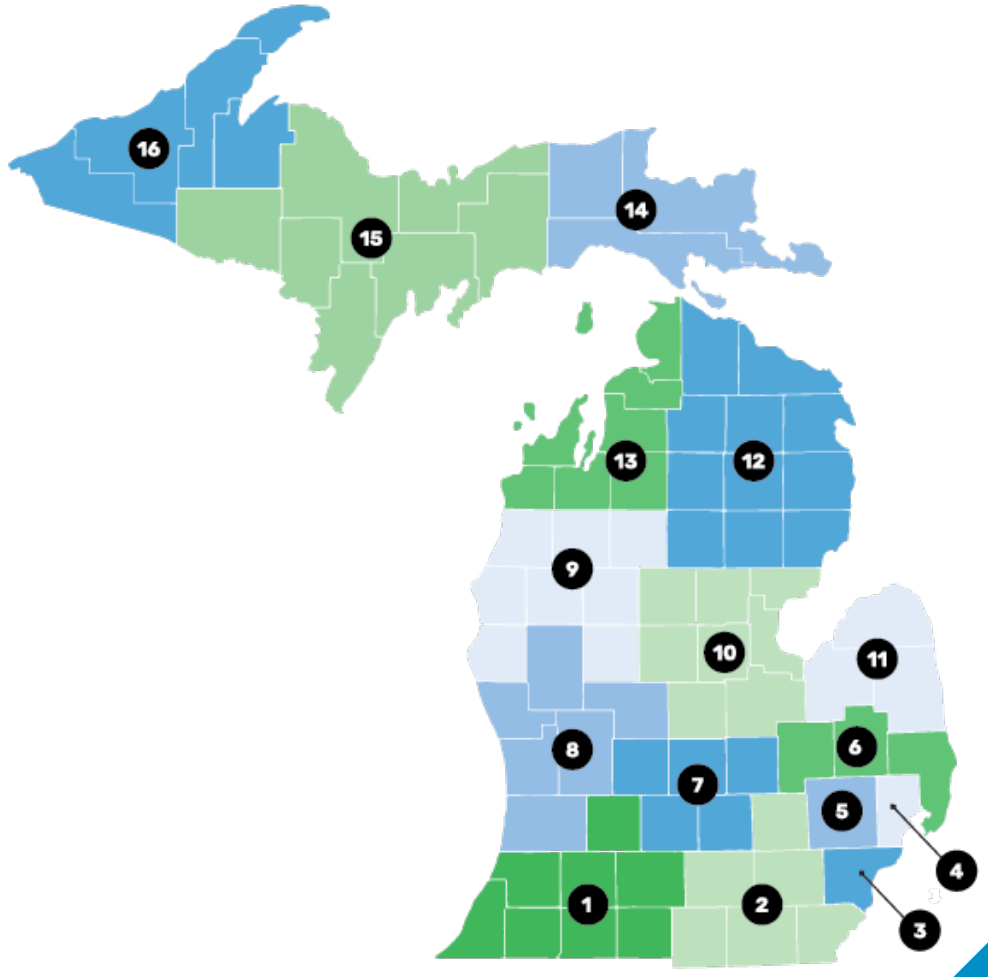
Before being informed of recent STEM initiatives, Michiganders were unsure (32%) how the state compares with others or said Michigan was average (35%).



Q18: . In comparison with other states around the country, how would you rate the quality of STEM education in Michigan?

Above Average (Unaided) | In comparison with other states around the country, how would you rate the quality of STEM education in Michigan?

Hub	Michigan is above average compared with other states for STEM education (unaided)
Hub 5 | **Oakland**	31%
Hub 3 | **Wayne**	31%
Hub 2 | **S. Cen.**	26%
Hub 4 | **Macomb**	25%
Hub 9 | **Cadillac+**	20%
Hub 8 | **GR+**	17%
Hub 1 | **SW**	16%
Hub 7 | **Lansing+**	16%
Hub 10 | **Tri-Cities**	16%
Hub 6 | **Genesee+**	14%
Hubs 14-16 | **U.P.**	14%
Hub 13 | **NW**	10%
Hub 12 | **NE**	7%
*Hub 11 | **Thumb**	7%



Q18: In comparison with other states around the country, how would you rate the quality of STEM education in Michigan?

Aided | Quality of Michigan STEM Education

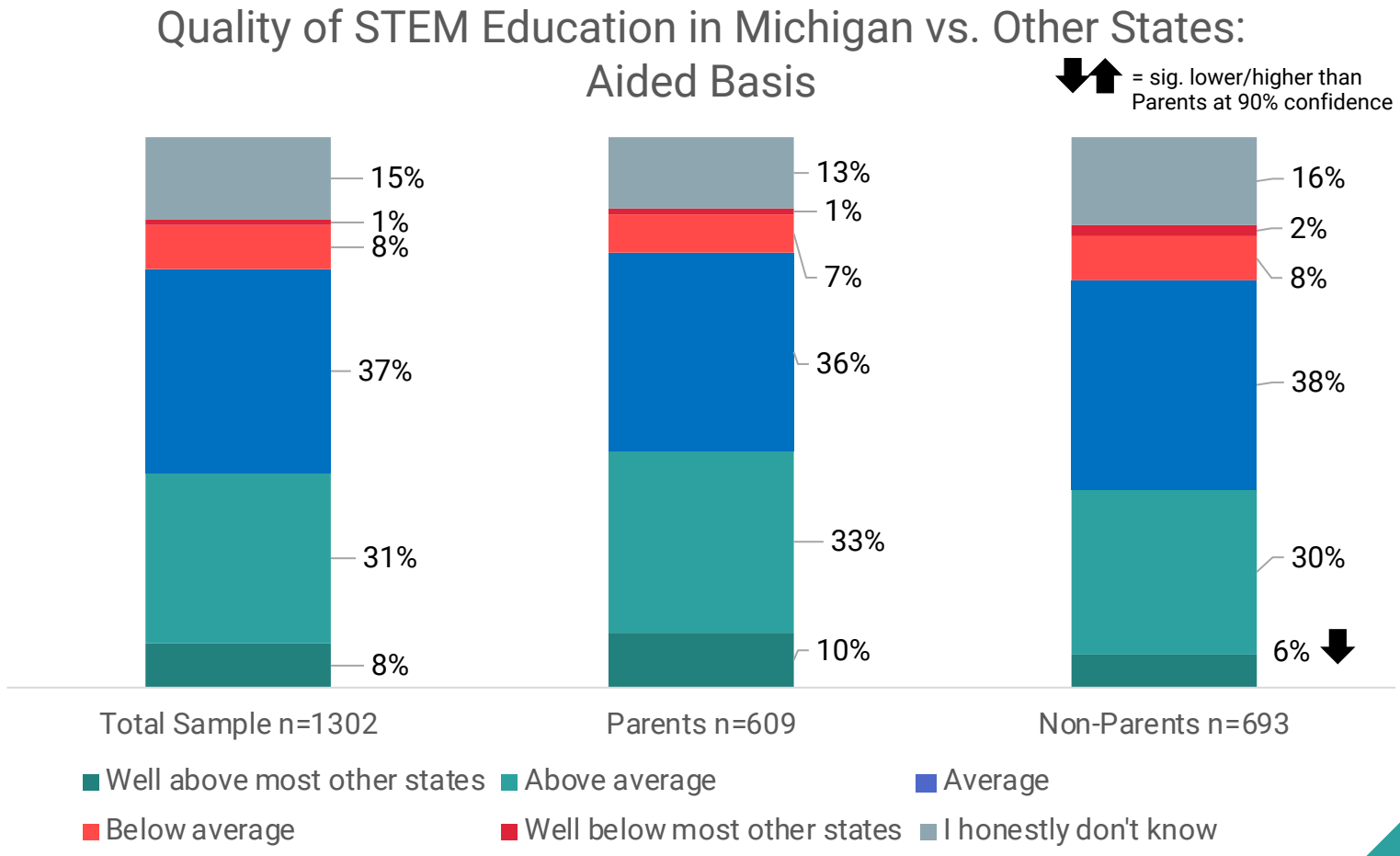
Participants were given a short description of several recent MiSTEM efforts to promote STEM-focused education. Upon seeing this short statement, perceptions of Michigan being above average nearly doubled (20% → 39%).

Descriptive Statement:

Over the past two years, Michigan has invested more than $6 million in local STEM programs. These grants include new, hands-on curriculum for classrooms and after-school programs, such as:

- Computer coding lessons for K-12 students
- Robotics education and competitions
- Science lessons outside in local waterways and woods

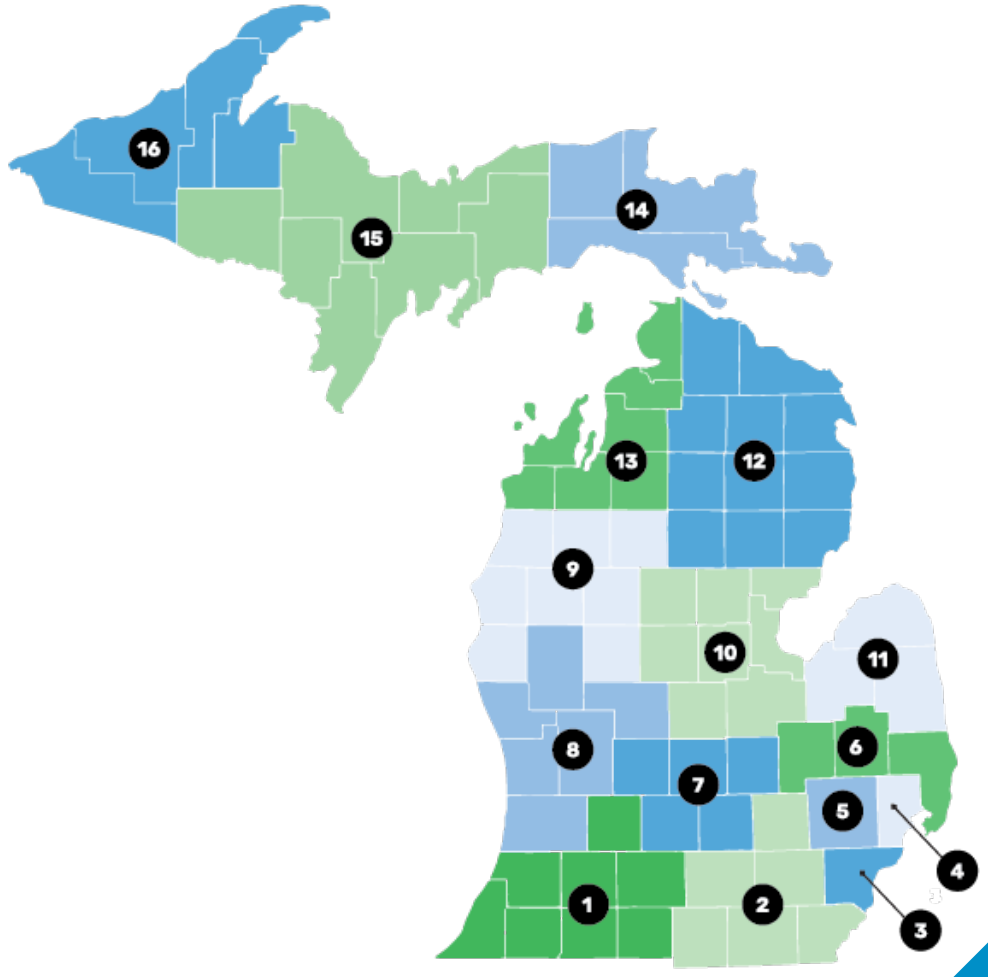
These programs impacted more than 300,000 K-12 students and more than 10,000 teachers.



Q19: Listed below is a short description of several recent actions taken around the state to promote STEM-focused education. Please take a moment to read this description.

Above Average (Aided) | In comparison with other states around the country, how would you rate the quality of STEM education in Michigan?

Hub	Michigan is above average compared with other states for STEM education (aided)	Increase from unaided
Hub 4 | **Macomb**	56%	**+31**
Hub 5 | **Oakland**	53%	+22
Hub 3 | **Wayne**	47%	+16
Hub 2 | **S. Cen.**	44%	+18
Hub 7 | **Lansing+**	43%	**+27**
Hub 1 | **SW**	40%	**+24**
Hub 8 | **GR+**	39%	+22
Hub 6 | **Genesee+**	35%	+21
Hub 10 | **Tri-Cities**	32%	+16
Hub 13 | **NW**	31%	+21
Hub 9 | **Cadillac+**	27%	+7
Hubs 14-16 | **U.P.**	25%	+11
Hub 12 | **NE**	20%	+13
*Hub 11 | **Thumb**	17%	+10



Q19: Listed below is a short description of several recent actions taken around the state to promote STEM-focused education. Please take a moment to read this description.

Support for MiSTEM Efforts

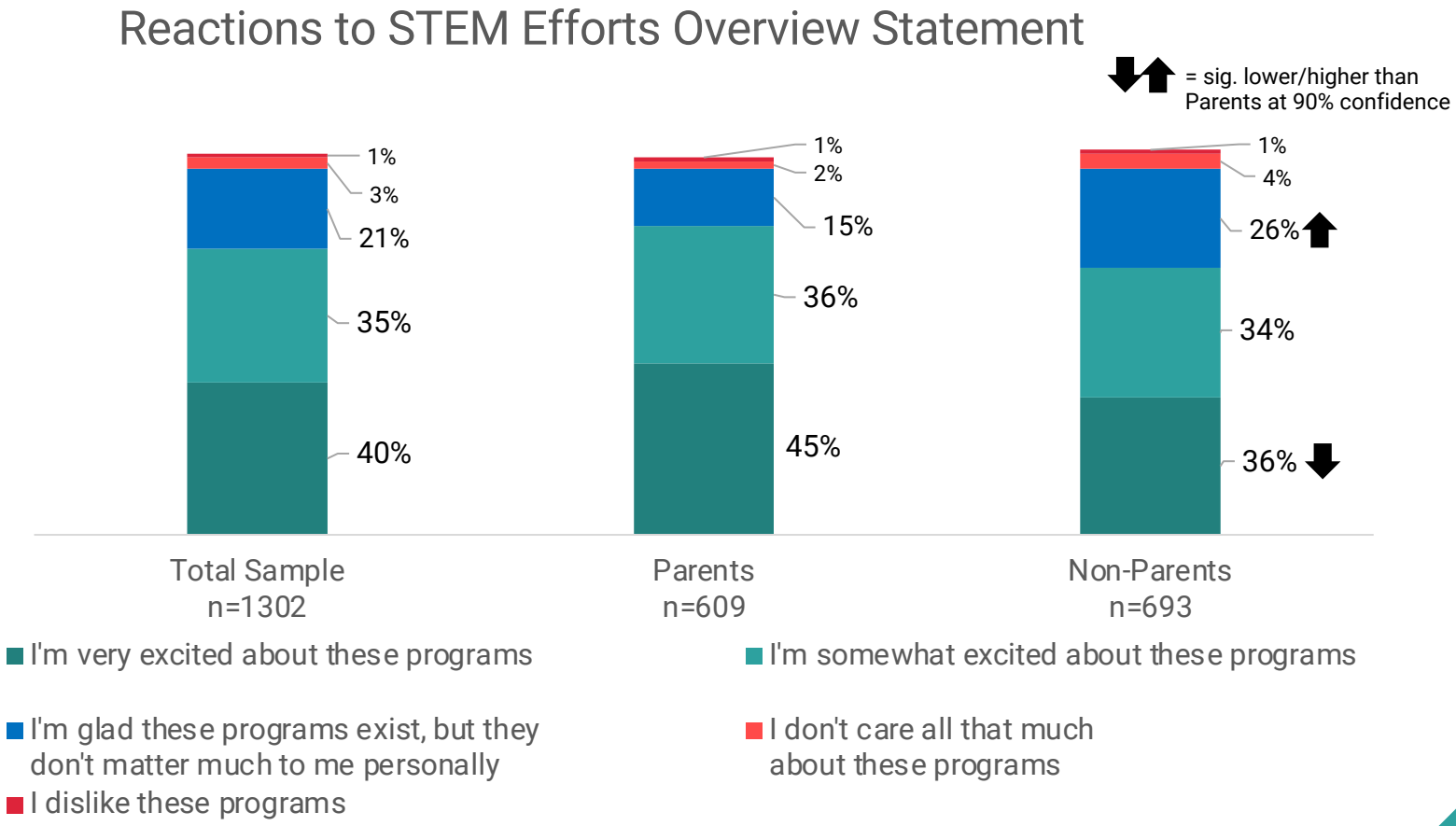
Recent MiSTEM efforts garnered excitement among most Michiganders, particularly parents. The statement was particularly effective in generating interest among Black (81%, top-2 box) and other POC (80%) respondents.

Descriptive Statement:

Over the past two years, Michigan has invested more than $6 million in local STEM programs. These grants include new, hands-on curriculum for classrooms and after-school programs, such as:

- Computer coding lessons for K-12 students
- Robotics education and competitions
- Science lessons outside in local waterways and woods

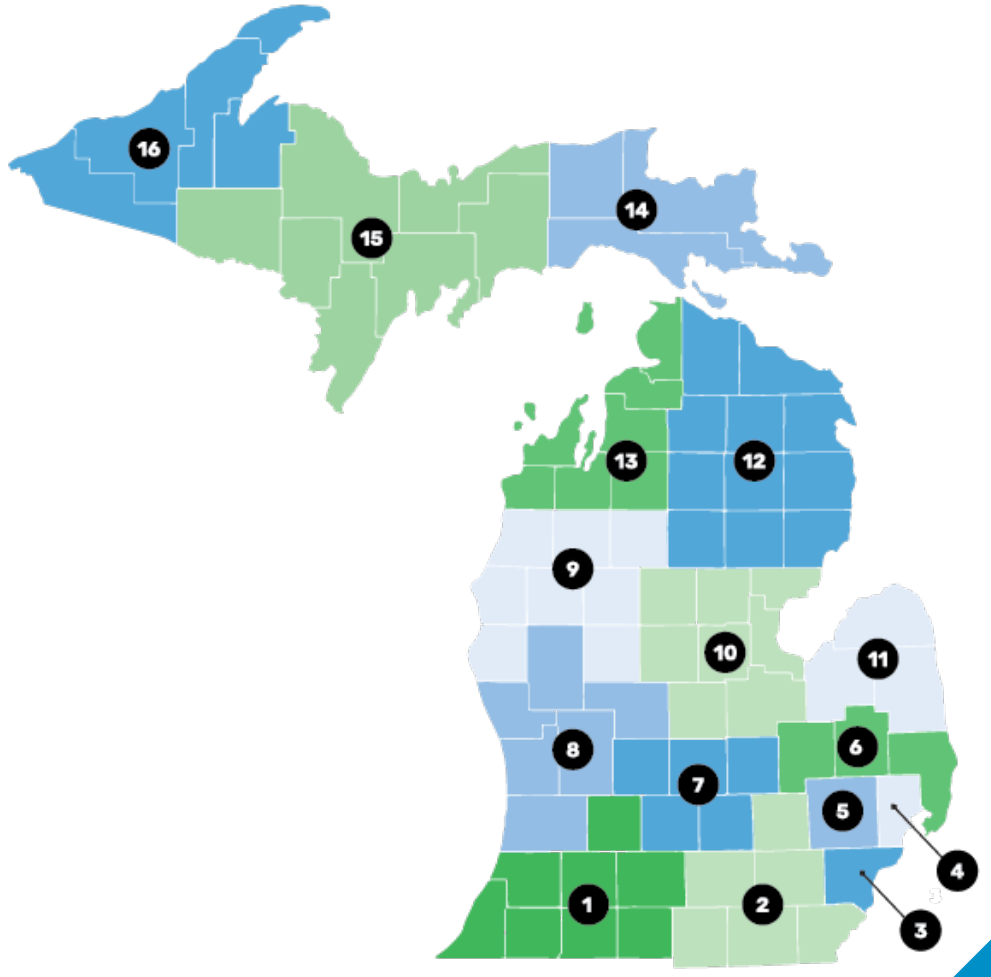
These programs impacted more than 300,000 K-12 students and more than 10,000 teachers.



Q20: Which of the statements below best describes how you feel about the new STEM learning programs being supported around Michigan?

Excited About Programs | Very or somewhat excited about new STEM learning programs being supported around Michigan.

Hub	Excited about new STEM learning programs
Hub 3 | **Wayne**	86%
Hub 2 | **S. Cen.**	84%
Hubs 14-16 | **U.P.**	81%
Hub 4 | **Macomb**	77%
Hub 6 | **Genesee+**	80%
Hub 1 | **SW**	77%
Hub 8 | **GR+**	75%
Hub 7 | **Lansing+**	74%
Hub 5 | **Oakland**	74%
Hub 9 | **Cadillac+**	73%
Hub 13 | **NW**	68%
Hub 10 | **Tri-Cities**	66%
Hub 12 | **NE**	59%
*Hub 11 | **Thumb**	57%



Q20: Which of the statements below best describes how you feel about the new STEM learning programs being supported around Michigan?

Local Availability of STEM Programs

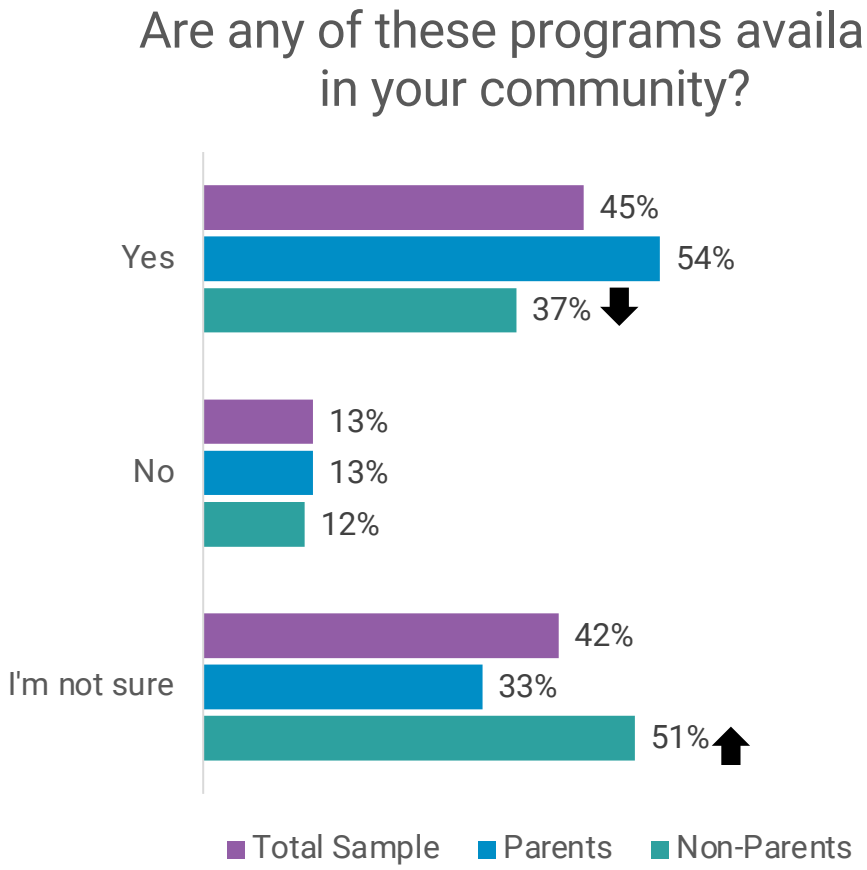
Many Michiganders were uncertain of whether any of the STEM initiatives listed were available within their own communities.

Descriptive Statement:

Over the past two years, Michigan has invested more than $6 million in local STEM programs. These grants include new, hands-on curriculum for classrooms and after-school programs, such as:

- Computer coding lessons for K-12 students
- Robotics education and competitions
- Science lessons outside in local waterways and woods

These programs impacted more than 300,000 K-12 students and more than 10,000 teachers.



Respondents with incomes under $35K (51%) were among the most likely to be unsure of whether the MiSTEM programs listed were available in their communities.

= sig. lower/higher than Parents at 90% confidence

Q21: As far as you know, are any of the STEM learning programs described on this page available in your community?

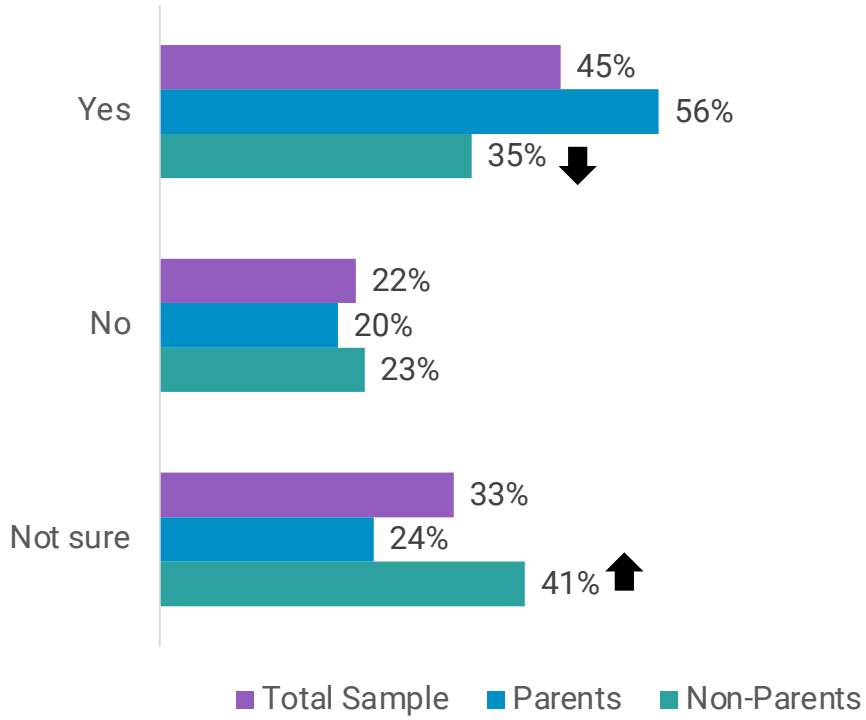
Local STEM Opportunities

MiSTEM Network

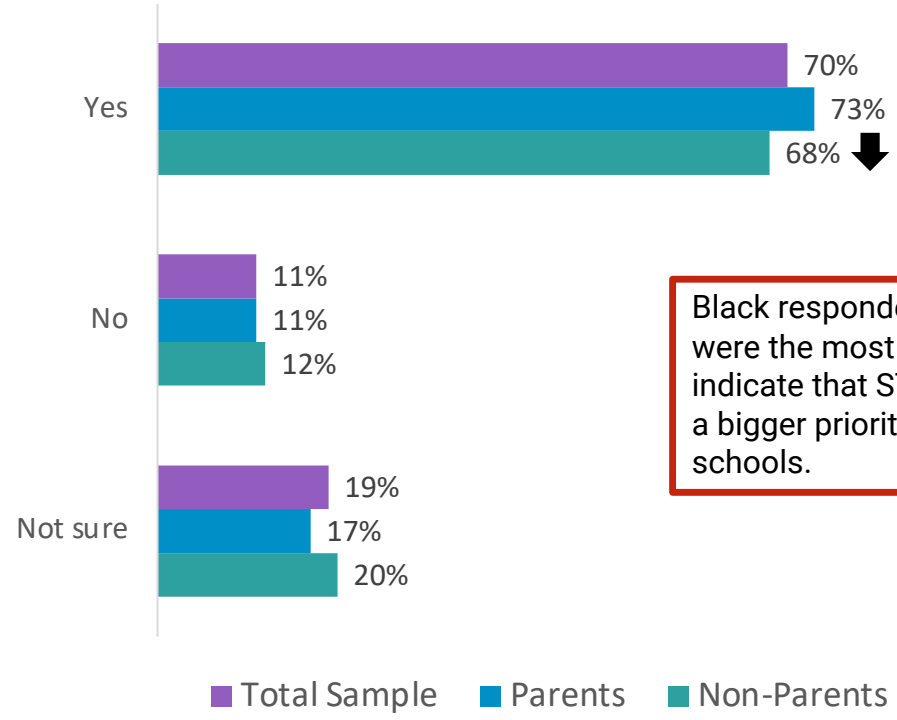
STEM in Local School District

A third of Michiganders are unsure if STEM education is currently a priority in their local school district, and 7 in 10 believe STEM education needs to be a bigger priority for their local school district.

Is STEM education a priority in your local school district?



Should STEM education be a *bigger* priority in your local school district?



Black respondents (81%) were the most likely to indicate that STEM should be a bigger priority in their local schools.

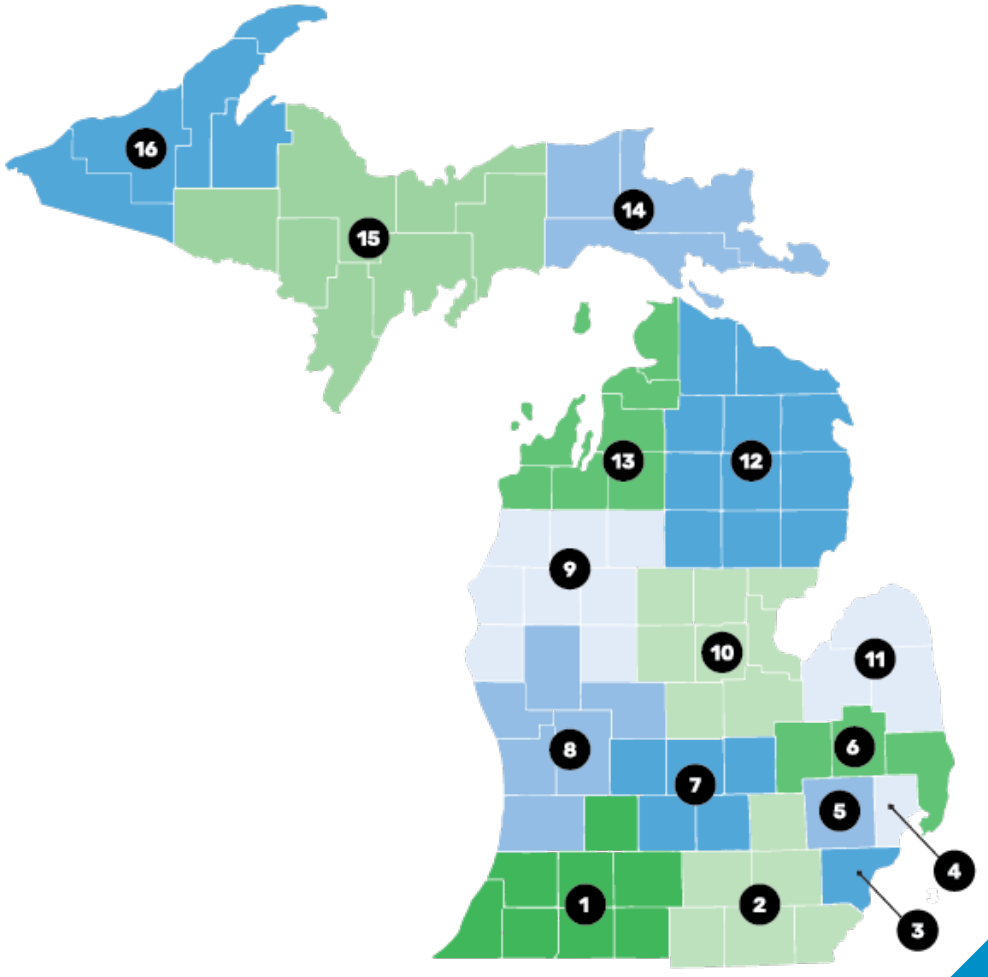
Q22: Do you think STEM education is already a priority in your local school district?
Q23: Should STEM education be a bigger priority in your local school district?

= sig. lower/higher than Parents at 90% confidence

40

Not a local priority | STEM education is already a priority in your local school district.

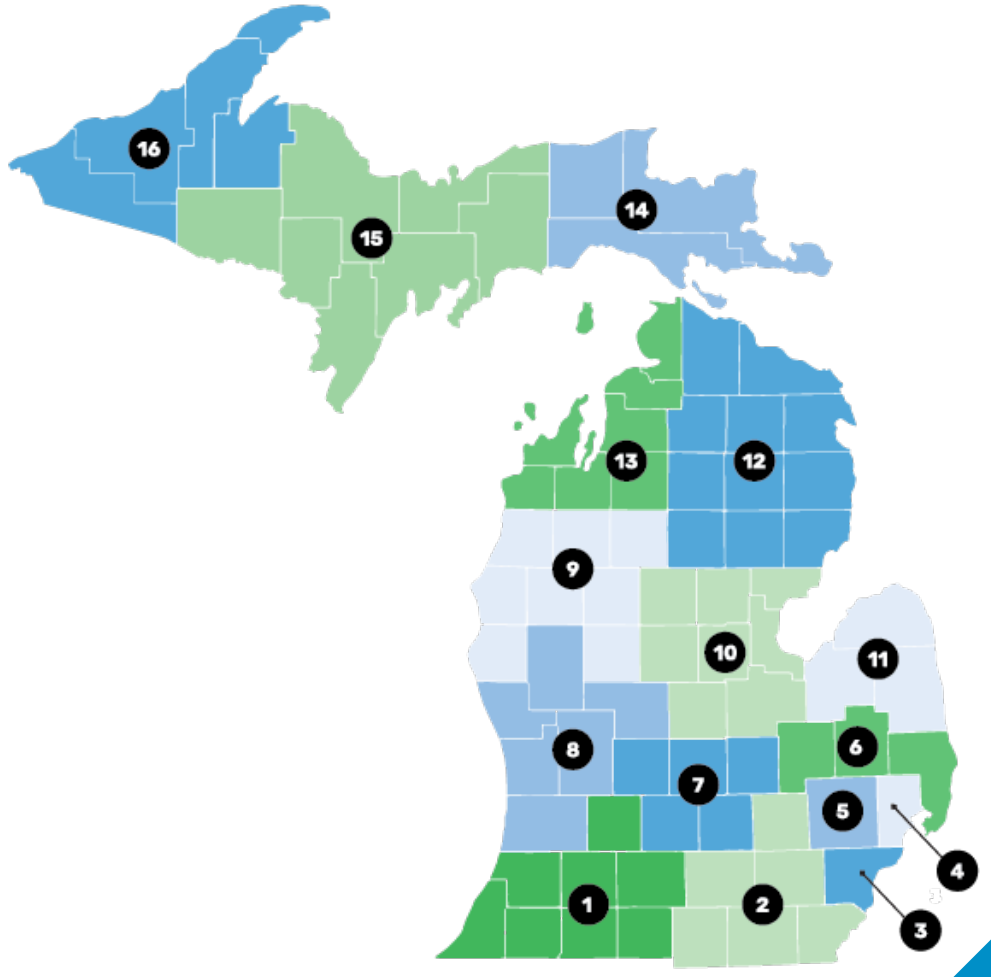
Hub	STEM education is <u>not</u> already a priority in my local school district
Hubs 14-16 | **U.P.**	32%
*Hub 11 | **Thumb**	27%
Hub 6 | **Genesee+**	26%
Hub 9 | **Cadillac+**	25%
Hub 7 | **Lansing+**	25%
Hub 12 | **NE**	24%
Hub 10 | **Tri-Cities**	23%
Hub 3 | **Wayne**	22%
Hub 2 | **S. Cen.**	23%
Hub 1 | **SW**	21%
Hub 13 | **NW**	20%
Hub 8 | **GR+**	18%
Hub 4 | **Macomb**	15%
Hub 5 | **Oakland**	10%



Q22: Do you think STEM education is already a priority in your local school district?

Should be a bigger priority | STEM education should be a bigger priority in your local school district.

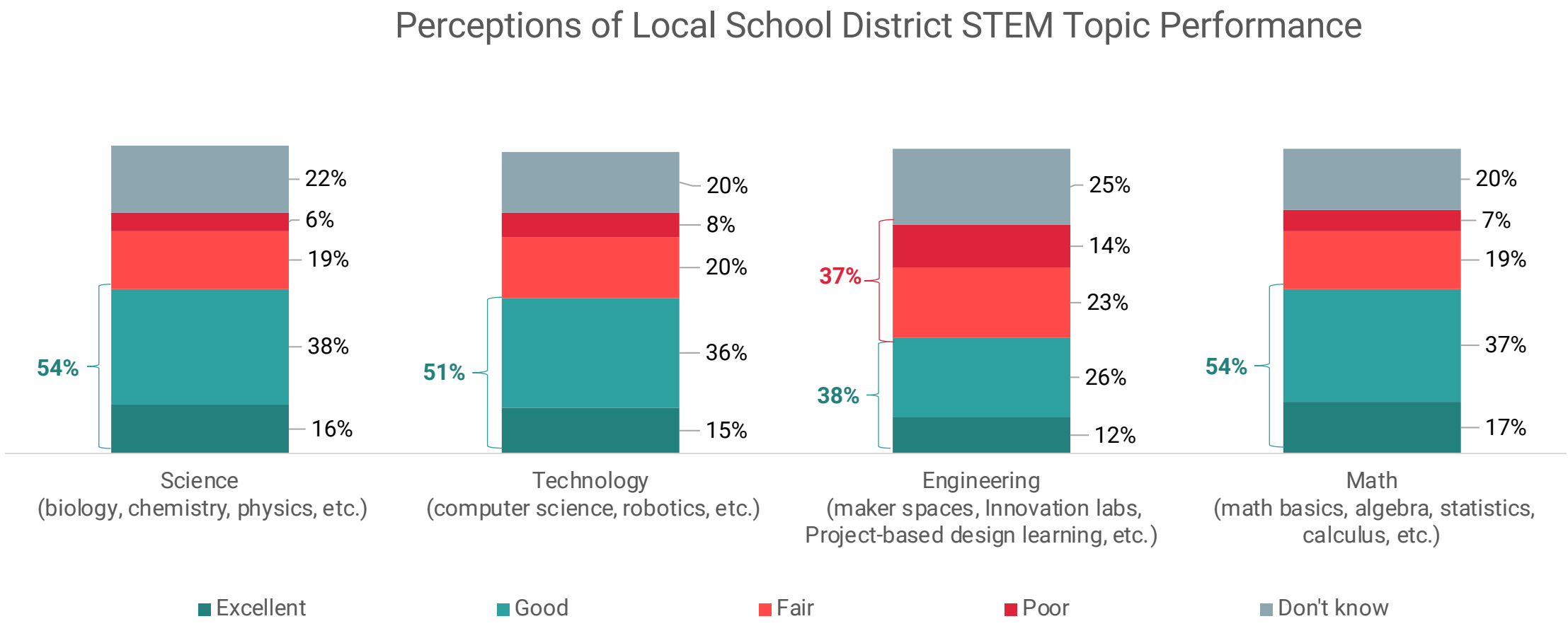
Hub	STEM education should be a bigger priority in my local school district
Hub 3 | **Wayne**	80%
Hub 2 | **S. Cen.**	78%
*Hub 11 | **Thumb**	77%
Hub 7 | **Lansing+**	76%
Hubs 14-16 | **U.P.**	74%
Hub 4 | **Macomb**	73%
Hub 8 | **GR+**	69%
Hub 13 | **NW**	68%
Hub 6 | **Genesee+**	68%
Hub 9 | **Cadillac+**	67%
Hub 12 | **NE**	65%
Hub 1 | **SW**	63%
Hub 5 | **Oakland**	63%
Hub 10 | **Tri-Cities**	63%



Q22: Do you think STEM education is already a priority in your local school district?

STEM Teaching in Local School District

Many Michiganders view the STEM teaching in their local school district favorably. However, more than 1 in 5 are unsure of how their school district performs. That uncertainty is driven by non-parents, who were twice as likely as parents to say they "don't know" how their school district performs on STEM topics.



Q24: Let's focus on the individual components of the STEM acronym – Science, Technology, Engineering, and Math. How well is your local school district performing in each of those topics?

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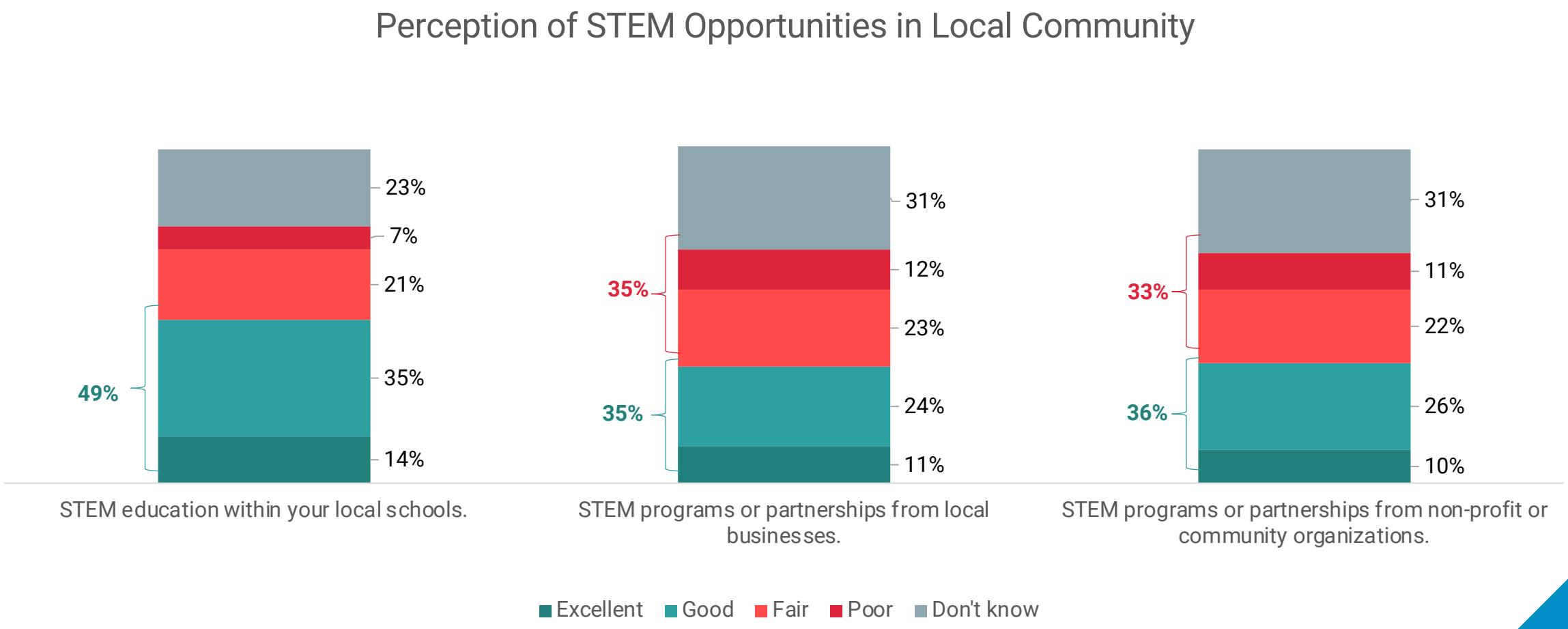
Strength of Local STEM Learning

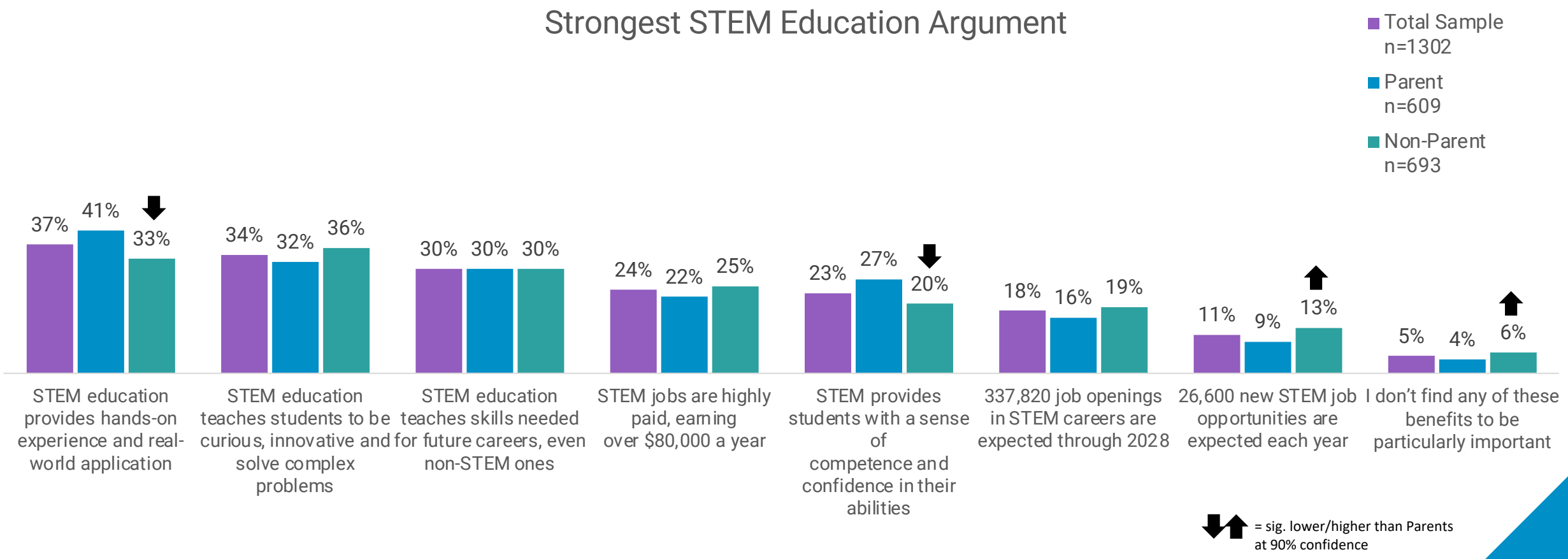
Similarly, many Michiganders are uncertain of any STEM-related learning opportunities (in and outside of school) within their communities. The disconnect was especially sharp among non-parents.



Q25: Students can be exposed to STEM learning through a variety of means, in and out of the classroom. From your viewpoint, how strong are these STEM-related learning opportunities within your local community?

STEM Messages

Messages that focused on real-world experience, skill development and developing intellectual curiosity were viewed as being stronger arguments for STEM education than number-driven, job-focused pitches.



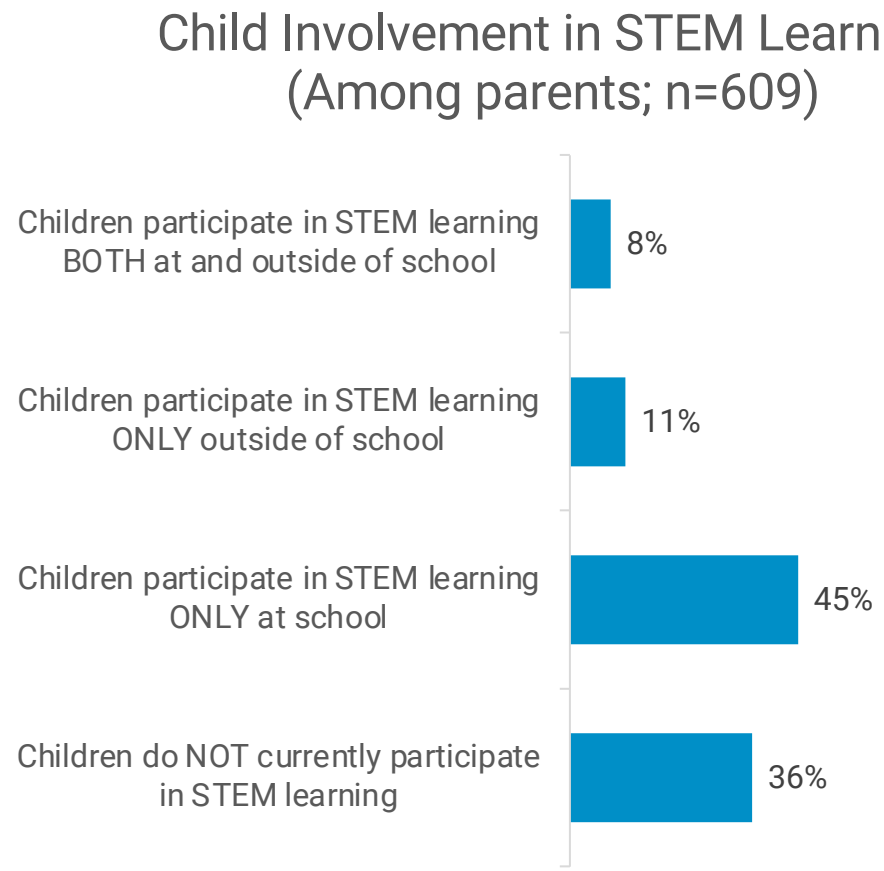
Q30: Several facts and benefits related to STEM education are listed below. Which of these benefits make the strongest argument for the State of Michigan's current focus on STEM education? Select up to two benefits that are the most important to you.

Parent Perception of STEM

MiSTEM Network

Parents Only | STEM Learning

Most Michigan parents believe their children receive STEM learning opportunities only through their schools. Over a third of parents indicated that their children receive no STEM learning at all.



BIPOC respondents (44%) were significantly less likely to report their children being involved in STEM learning activities in school compared with their white counterparts (56%).

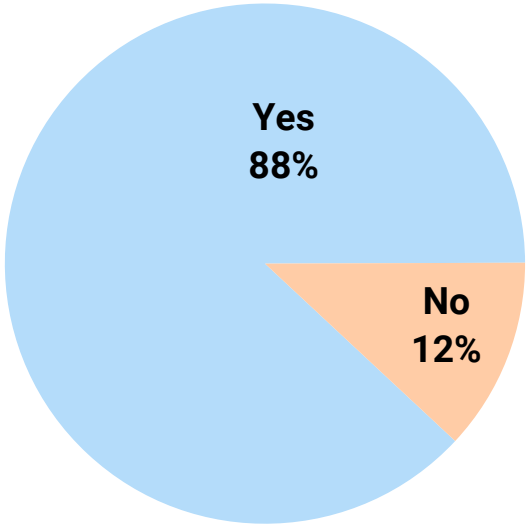
Affluent households (earn $80K+; 64%) were much more likely than less affluent households (48%) to indicate that their children participate in STEM learning at school. Households earning under $35K (44%) were the most likely to indicate that their children do not participate in any STEM learning.

Q26: Are your children currently involved in any form of STEM learning, either in or outside of school? Select any that apply.

Parents Only | Good Fit for STEM

Overwhelmingly, Michigan parents felt that a STEM-focused curriculum was a good fit for their children, largely due to their children's interest in the topics and the applicability of STEM skills later in life.

Is a STEM-focused curriculum a good fit for your children? (Among parents; n=609)



Parents from urban areas (93%) were more likely than those from suburban (86%) or rural/farm (87%) areas to indicate that a STEM-focused curriculum was a good fit for their children.

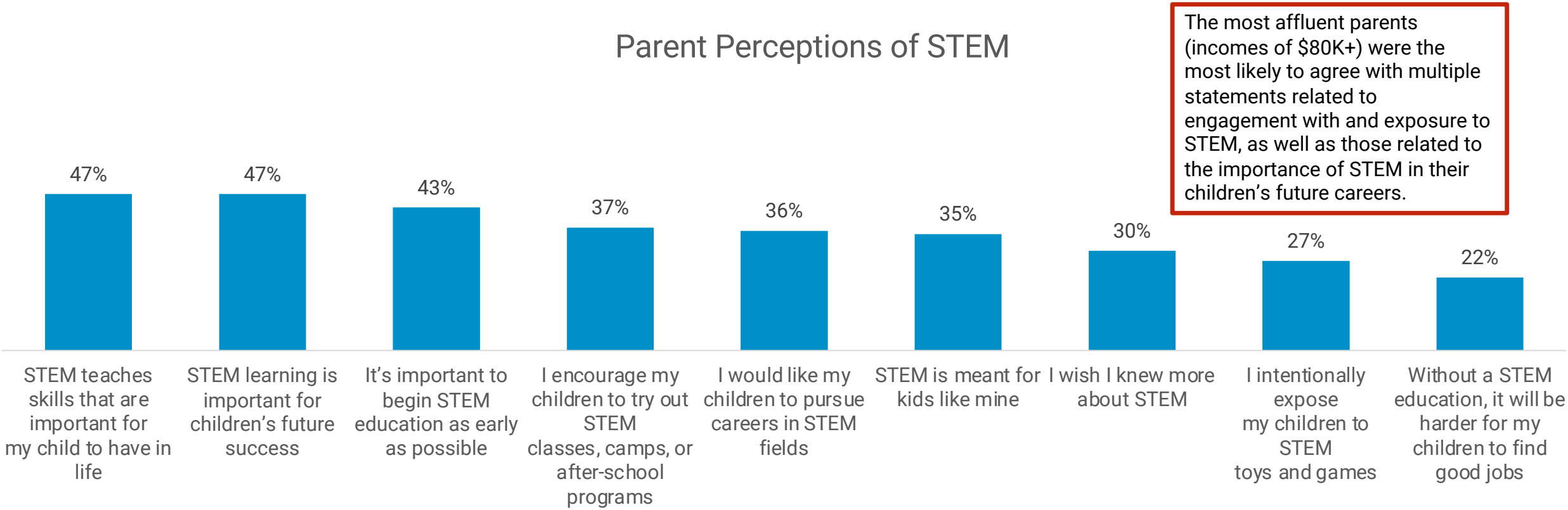
Why do you say that? (n=533)	
Kids enjoy it/Kids are smart/Kids like STEM subjects	22%
Prepare for college/Prepare for future/Prepare for careers	18%
Hands-on learning/Need these skills	15%
Broadly applicable/Lots of opportunity/ Help child be successful	12%
It's great/It's important (nonspecific)	12%

Why do you say that? (n=76)	
Kids not interested/Don't understand it/ Don't like STEM subjects	34%
Kids should be exposed to broad areas/ Different kids, different skill sets	16%
Don't know/No opinion/N/A	14%
Not enough emphasis on skilled trades or art/ There are other areas to focus on	11%

Q27: Is a STEM-focused curriculum a good fit for your children? Q28: Why do you say that?

Parents Only | Perceptions of STEM

Parents were most likely to agree with statements that tied STEM learning to critical life skills and future career success, even though only a third stated that they would like their children to pursue a career in a STEM field.

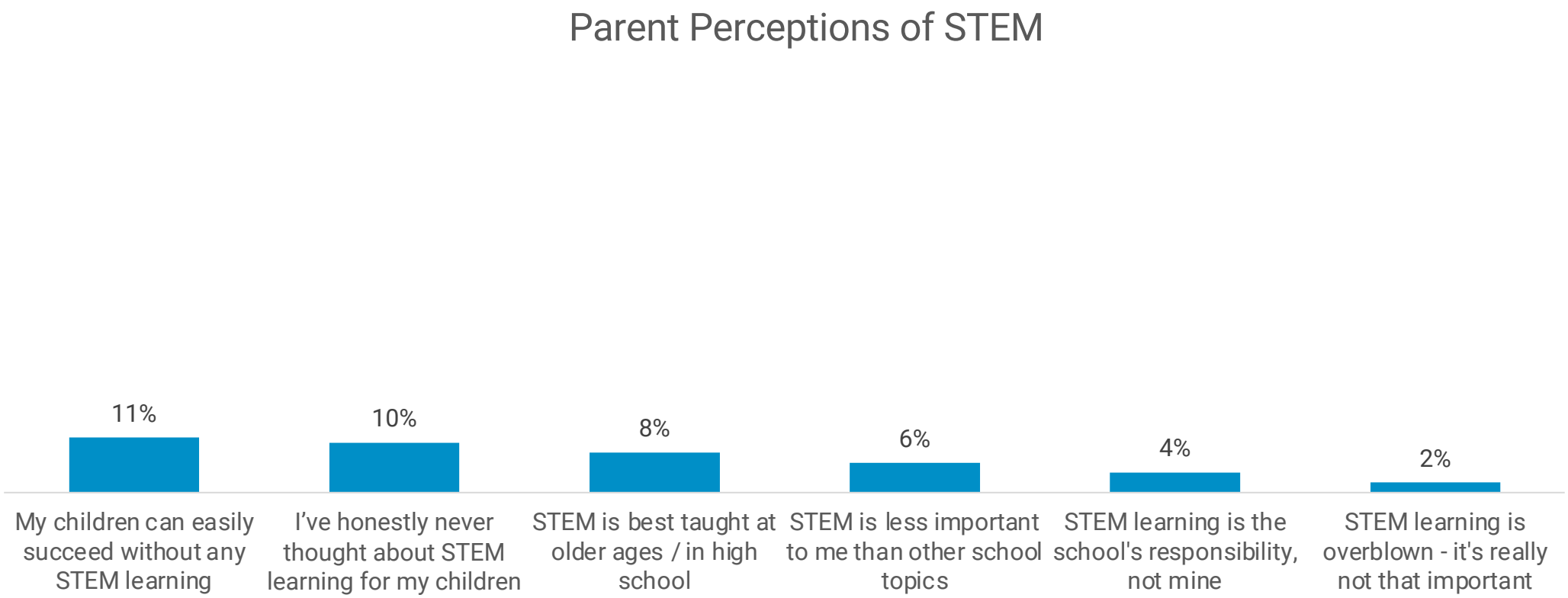


The most affluent parents (incomes of $80K+) were the most likely to agree with multiple statements related to engagement with and exposure to STEM, as well as those related to the importance of STEM in their children's future careers.

Q29: Which of the following statements about STEM do you agree with as a parent? Select all that apply.

Parents Only | Perceptions of STEM

There was very little agreement with the negatively keyed statements, indicating that active pushback against STEM learning is minimal among Michigan parents.



Q29: Which of the following statements about STEM do you agree with as a parent? Select all that apply.

Summary

MiSTEM Network

STEM learning was recognized as crucial to the future success of Michigan students and the state economy.

- Most respondents, regardless of demographic group or parental status, agreed that STEM education was very important in Michigan K-12 schools.
- Further, STEM learning methods and skills were consistently prioritized over softer, less “hands-on” skills.
- STEM learning was viewed as a stepping-stone to future success for students, as well as being a necessary tool for the state economy.
- Reactions to a basic overview of recent MiSTEM efforts were extremely positive and led to greater perceptions of how Michigan STEM efforts stand up against other states.
- Almost all Michigan parents felt that STEM-focused education was a good fit for their children, due to both interest on the part of their children and the potential for STEM to better prepare their children for future success.
- Outright rejection of or active pushback against STEM learning was infrequent, regardless of parental status.

MiSTEM Network

Awareness and understanding of existing STEM efforts was inconsistent, particularly among non-parents.

- Despite the widespread recognition of the importance of STEM learning, uncertainty about the current status of STEM learning in Michigan was evident:
  - Many respondents were uncertain of the accessibility of STEM learning to various demographic and geographic subgroups.
  - On an unaided basis, a third of respondents were unsure of how Michigan's STEM learning efforts compare with those of other states.
  - Nearly half of all respondents were unsure if the types of STEM programs described in the survey were available in their own communities. Further, a third of all respondents indicated that they did not know if STEM education was a priority in their local school district.
  - Similarly, many respondents were uncertain on how their local schools were performing on basic STEM curricula and were also unsure of the availability of STEM opportunities outside school in their own communities.
- Non-parents were consistently less informed about STEM learning than parents, a result that is not necessarily surprising but is noteworthy given the overall makeup of parents vs. non-parents statewide.

More educated and more affluent households were the most involved with STEM learning and metro Detroit hubs were the most optimistic.

- Younger, more affluent and more educated respondents tended to be the most familiar with STEM learning as a concept and the most engaged with STEM learning as parents.
- However, several nuggets in the data indicate a strong desire for more STEM learning opportunities among Black respondents and urban communities.
  - When asked about the importance of STEM education in K-12 schools in Michigan, Black respondents and people in urban areas were among the most likely to indicate that STEM was “very important.”
  - Black respondents were also the most likely to state that STEM education should be a greater priority in their local schools, regardless of the current state of STEM learning in those schools.
  - Parents from urban locales were more likely than suburban or rural parents to state that a STEM-focused curriculum was a good fit for their children.

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Thank you!