



Evaluation Report:

UL Innovative Education Award



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Executive Summary

UL and the North American Association for Environmental Education have led the UL Innovative Education Award (ULIEA) since 2015. A first-of-its-kind opportunity for non-profits in the United States and Canada, ULIEA is designed to invest \$250,000 annually in innovative programs that use the environment as a pathway to STEM learning for young people (E-STEM). Award winners also receive mentoring from UL and NAAEE, as well as the opportunity to be a part of the ULIEA network of winners. As a result of this initiative, ULIEA aims to help young people become future leaders in E-STEM fields.

In 2018, New Knowledge Organization Ltd. and Blue Lotus Consulting & Evaluation conducted an evaluation of the ULIEA initiative to describe its impacts from 2015 to 2017. From March to June 2018, we interviewed and surveyed leaders of programs that had received awards, along with short interviews of young people who participate in these programs. This report summarizes the results of the evaluation. The Executive Summary describes the most important outcomes, some of which are integrally related.

Achieving Program Diversity – ULIEA has attracted and elevated a wide range of programs from across the US and Canada, with varied audiences and communities. The award approach successfully incorporates small programs with as few as 60 regular participants to nationwide programs involving over 40,000 people. ULIEA winners hail from large urban centers like New York City and Chicago, to remote rural areas in Newfoundland and Idaho. Most importantly, ULIEA supports diverse program models, from youth-led summits that promote community action on environmental issues like climate change, to installing green houses and modules in city schools to help students make food systems more equitable, to design challenges that connect young people across international boundaries so that they can create solutions to local problems, to programs that engage young people in institutional research so they can pursue study and careers in the natural sciences.

Spreading Innovation – The ULIEA initiative attracts programs that are leaders in innovative approaches to engaging young people in E-STEM. It also seeds continued innovation by convening program leaders in award-winners' summits and other meetings – an opportunity program leaders say is essential. When program leaders are in contact with each other, they share ideas, teach new skills, and develop connections. Two-thirds of the award winners have already collaborated, for example, by exposing their students to each other's program offerings or by using a learning product in a different setting. Receiving the award also encourages program leaders to increasingly experiment with their program. The ULIEA model's emphasis on awarding existing excellence – rather than putting limitations on award recipients – gives program leaders the confidence to pursue new ideas.

Growing Audiences – The ULIEA initiative enables programs to expand their audiences, offering learning experiences to more young people. Most programs increase their youth participants by 10-30% after winning the award. Today, ULIEA award winners reach over 60,000 young people in total. For many award winners, audience growth entails expanding their geographic reach by working with new communities, regions, and even countries.

Building Transformative Youth Experiences – Having identified some of the top E-STEM programs in North America, ULIEA is a clearinghouse for creativity and novel approaches in youth learning opportunities. According to program leaders, ULIEA helps them scale up and intensify learning experiences for young people by offering more program hours, reaching new students who may not otherwise have the opportunity to participate in high-quality programming, and increasingly putting young people in the driver's seat of designing solutions to E-STEM problems in their communities. After winning their award, program leaders partner with more and bigger organizations, which in turn increase their ability to deliver learning opportunities and reach larger audiences. From students' perspectives, their

programs continue to deliver inspiring learning opportunities after winning the award. Youth have the chance to study complex environmental issues, such as waste management, climate change's effects on recreation industries, and plastic's effect on local food systems. In some programs, youth design solutions to those issues and advocate for those solutions with business leaders, community organizations, local government, and scientists in their regions. In other programs, young people learn how their communities are ripe for scientific study and learn that they can be leaders in their neighborhoods or regions. For young people, these afterschool programs open the door to learning that is truly fun and meaningful to their future education and career paths.

Building Organizational Capacity – Program leaders embrace ULIEA as a unique platform for holistic strengthening organizations and programs. The award's open-ended structure enables program leaders and their staff to think strategically about how to improve their program design and expand impact on youth. The opportunity to receive guidance from UL on safety issues, learn from consultants and experts in ULIEA network, and meet peers at other innovative organizations is seen as an extremely valuable professional development experience. The ULIEA experience helps organizations rejuvenate their passion and refine their skills for E-STEM education.

Enhancing Reputation – Receiving an award strongly improves programs' reputation, thereby increasing their ability to provide more learning opportunities for young people. Being named a ULIEA winner confers prestige on account of the focus on innovation, as well as the sponsorship of UL and NAAEE, as large-scale and respected organizations. The ULIEA is an honor for organizations of any size and location. For small programs that are new or locally focused, ULIEA validated their program design, which has enabled them to receive more funding. Even larger, more established programs have received new attention as a result of the award. Award winners are also able to use the award to leverage more funding for their programs and youth participants.

Conclusion

The evaluation of the 2015 – 2017 UL Innovative Education Award shows that the initiative is achieving its objectives of supporting innovation in E-STEM learning programs and providing young people with learning experiences that help them become leaders in E-STEM fields. In the ULIEA model, two primary factors contribute to this success. First, the ULIEA functions as a true award initiative that promotes creativity and recognizes award winners' ability to prioritize opportunities for youth. Second, ULIEA's practice of convening award winners scales up innovation by enabling program leaders to share strategies for engaging youth in E-STEM learning and collaborate on new work. This initiative has resulted in an increase in youth who have access to E-STEM learning programs, as well as improving the quality of those learning experiences.

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Introduction

The UL Innovative Education Award (ULIEA) was established 2015 by UL's Education & Outreach (UL), in collaboration with the North American Association for Environmental Education (NAAEE). The award program aims to empower the next generation of leaders to develop science-based sustainable solutions for their communities. A first-of-its-kind initiative, the award program invests up to US \$250,000 each year in innovative non-profit programs that use the environment as a pathway to STEM learning for youth in the United States and Canada.

In 2018, UL and NAAEE partnered with an evaluation team from New Knowledge Organization Ltd. (NewKnowledge) and Blue Lotus Consulting & Evaluation, LLC (Blue Lotus) to assess the impacts of the ULIEA initiative. The evaluation questions were:

1. How does ULIEA support innovation in the field of E-STEM?
2. How does this award build capacity in the field of E-STEM innovation?
3. How are organizations, groups, and people influenced by the program, directly or indirectly?

This report describes the results of this evaluation, which focused on results accumulating from the ULIEA efforts in 2015, 2016, and 2017.

NUTS & BOLTS OF THE AWARD PROGRAM

Each year, the ULIEA invites non-profits from across the United States and Canada, as well as their territories, to submit an application for programs that exemplify innovation in using the environment as a pathway to STEM learning for youth. Applicants fill out an online form that explores their program design, audiences, and impacts, specifically in the following areas:

- Advancing STEM learning
- Citizenship and social responsibility
- Solutions for environmental challenges

The award is unique for its focus on existing achievements in these areas. The majority of funding available to E-STEM programs tends to be in the form of government grants and grants from foundations, which prioritize new programs. The ULIEA instead incentivizes programs already in operation that demonstrate innovation and excellence.

The Applicants – To be awarded, applicants must prove their effectiveness in E-STEM by demonstrating student impact, student reach, and innovation in program design. Applicants must also be registered as non-profits in the United States or Canada, serve youth from Kindergarten through 12th grade, and have an annual budget of below US \$3 million.

Judging – The ULIEA judging is a rigorous process that happens in three phases. Judges are recruited for their leadership in E-STEM work, representing diverse perspectives. UL employees also serve as judges in several judging phases.

First, Desk Review judges independently assess sets of applications. These judges identify a set of short-listed applications that advance to the next round. At the Semi-Finals Judging, a select group of judges from E-STEM disciplines and UL meet in person to assess the short-listed applications. These judges promote 10 applications to the next round, with clarifying questions for each of the 10 advancing applicants.

Before the Finals Judging, the 10 finalists are asked to submit brief videos that respond to the clarifying questions asked by the Semi-Finals judges. During the Finals Judging day, the 10 applicants also participate in a video interview. The Finals Judging team, composed of UL employees and independent E-STEM experts, selects 5 award winners and 5 honorable mentions.

Across all judging phases, judges use the same scoring rubric, which are also made available to applicants. The rubric is available at:

<http://ulinnovationeducation.naaee.net/resources>

The Winners – Each year, one grand prize winner receives \$100,000 in award funds. Two second-tier winners each receive \$50,000, and two third-tier winners each receive \$25,000. All winners are also offered mentoring in safety from UL employees, and invited into the network of UL Award winners. This network includes winners from all years and provides opportunities for sharing ideas, learning from peers, and collaborating with peer organizations. Over the course of three years (2015, 2016, and 2017), 15 organizations have received awards from the ULIEA initiative.

Award Design – In 2013, UL and NAAEE commissioned exploratory research on the state of E-STEM innovation throughout the world. This research identified gaps in funding and resources that limited the ability of creative program leaders from innovating, which created barriers to superlative E-STEM learning opportunities for youth. Based on that research, UL and NAAEE developed the UL Innovative Education Award. The award's rubrics and goals were derived from the original research, which continue to shape the initiative today.

The 2013 research report is available here:
http://ulinnovationeducation.naaee.net/sites/default/files/resources/ESTEM_Report.pdf (Fraser et al., 2013).

EVALUATION OVERVIEW & THIS REPORT

The evaluation team consisted of researchers from NewKnowledge and Blue Lotus. These two organizations had prior experience with the ULIEA initiative: NewKnowledge did the original research and continues to moderate the judging processes and Blue Lotus participates as judges and advisors to the award team. From January to June 2018, the evaluators used multiple methods to illuminate the impacts of the ULIEA:

Narrative-Based Interviews – Evaluators conducted in-depth, open-ended interviews with leaders from all 15 award-winning organizations from 2015 to 2017. The interview transcripts were then coded to identify prevalent themes.

Program Leader Surveys – Program leaders completed an online survey that explored specific impact areas. The survey questions were developed based on data from the interviews so that the survey could be used in subsequent years with each cohort of award winners to track impacts over time. Ten winner organizations submitted surveys: four from the 2015 winners cohort, two from 2016, and four from 2017. We summarized data with descriptive statistics and textual analysis from open-ended questions.

NAAEE also conducted **Youth Interviews** with students who participate in the programs that received the 2017 ULIEA awards. These interviews helped to tell the story of youth impact winning programs achieve. We summarize these interviews in a companion report, entitled *UL Innovative Education Award: Stories of Youth Experiences*.

For more details on methods and analysis, please see the Methods chapter (page 14).

Findings

HOW INFORMATION IS ORGANIZED

First, we explore how ULIEA winners rank the strongest impacts to their programs since receiving their award. Next, we focus specifically on different types of audience impacts. The remainder of the report is organized according to the themes identified in the original research conducted on the state of innovation in E-STEM learning, as presented in the *2013 E-STEM Blueprint for Success* report. These themes are:

- Professional Development
- Real Connections
- Practical Synthesis
- Creativity in Critical Thinking

Across these four themes, we describe how leaders of award recipient organizations conceptualize the impact of the ULIEA initiative. In particular, we discuss perspectives on how the award has affected youth, organizations, organization leadership, and communities. How award winners describe their impacts demonstrates the strengths of the award and may help UL direct its investments in the award program.

STRONGEST IMPACTS & YOUTH IMPACTS

Both the interviews and survey showed that the ULIEA initiative's strongest area of impact was expanding organizations' capacity to provide innovative E-STEM learning opportunities. For many organizations, they used the award to build capacity through better engaging with their communities and partners. Meanwhile, others focused specifically on expanding youth engagement and learning opportunities.

In interviews, all 15 award winners described network building and increasing organization capacity as their most valued areas of impact since receiving the ULIEA (see the Appendix for the frequency impact areas were mentioned in interviews). Survey data corroborated this emphasis on capacity and networking: when asked to rank the strongest areas of impact from a list of general areas, winners were

most likely to rank community and partner engagement as the top area of impact. When we consider the second most highly ranked areas of impact, expanded reputation and youth education were clearly valuable to ULIEA winners as well (Table 1).

Table 1. Top-ranked areas of impact for ULIEA award winners.

Area of Impact	Ranked 1 st	Ranked 2 nd	Ranked 3 rd
Reputation	3	4	3
Community & Partner Engagement	3	1	4
Access to Funding & Funders	2	1	0
Youth Education & Engagement	1	4	3
Other	1	0	0

Award winners also ranked areas of impact specifically related to youth education and engagement in the survey (Table 2). Winners were most likely to say that program offerings for audiences and the geographic range of their audiences had improved after winning the ULIEA.

Table 2. Frequency with which respondents ranked aspect of Youth Education and Engagement in first through third place.

Area of Youth Impact	Ranked 1 st	Ranked 2 nd	Ranked 3 rd
Program offerings	4	2	0
Geographic range of audience	3	3	0
Audience size	1	2	1
Program contact hours	1	1	2
Audience's program experience	0	1	1
Youth knowledge gain	0	0	2
Other	2	0	0

Note. The descriptions for Other were "None of the above" and "diversity and equity."

After ranking these aspects of Youth Education and Engagement, program leaders described how the award impacted the area that they ranked first. The four winners who ranked program offerings as the most impacted aspect talked about bringing in additional teachers and students in different grade levels, launching new programs, and enabling new experiences for students, such as travel to conferences.

All three award recipients who ranked geographic range of audience as the most-impacted aspect talked about expanding programs to additional U.S. regions and even additional countries. One program leader credited this type of expansion to the reputation boost that came from winning the award, and another respondent said the financial boost helped them expand their audience.

One program that cited the impact of diversity and equity talked about using the award funds to target and recruit students and staff from groups that were previously under-represented in their programming.

Many of these innovations in program design and infrastructure have resulted in new developments in youth learning and leadership. In the survey, award recipients told stories of youth leadership. Youth who created a strategy for waste reduction presented their idea to a local hotel developer, who is working with students to implement that idea in new buildings. In another award winning program, youth are replicating their event focused on climate change solutions in other countries, where they lead workshops with adults and students. Youth in rural areas are developing relationships with E-STEM professionals in their region, with an eye toward pursuing college degrees in E-STEM fields and potentially returning to their area to work in this sector. These stories are included in full detail in the Appendix.

Award winners also reflected on their own impact on pathways to E-STEM careers for young people since they received their award. They focused on two general areas: inclusivity and identity. Those who achieved impacts in inclusivity, used their award to ensure greater access to opportunity for all individuals and expand recruitment into more communities. Those who focused on identity strived to help students identify as scientists by exposing them to careers they hadn't encountered or thought were possible.

One described how program alumni are entering careers in the environment, engineering, communications, policy, and science.

In the future, award winners hope to gain support in finding more volunteers and connections to other ULIEA winners, a larger E-STEM network, as well as *"other projects doing citizenship and youth development / leadership work."* One made a request for information on best practices in youth program design, and another requested support for student travel to networking events.

Next, we explore how these findings relate to the research the ULIEA initiative was built on. Three of those four indicators found in that research were particularly relevant to awardees' experience with the ULIEA initiative and the impact it has had on their organization including: Professional Development, Real Connections, and Practical Synthesis. While the fourth area from the original research, Creativity in Critical Thinking, did not emerge in this study, ULIEA recipients have already demonstrated through their award applications and status as award winners that this component is already present in their programs.

CAPACITY BUILDING: PROFESSIONAL DEVELOPMENT

The *Blueprint for Success* report outlines Professional Development as follows:

Professional development represents the most important components of innovation in E-STEM: professional development and the need for collaboration between informal and formal educators. It also includes the need for collaboration between formal educators and other types of E-STEM professionals.

Growth in Organizational Capacity, Outreach, & Funding

The ULIEA initiative excels at increasing the capacity of award winners to improve their program offerings, access funding, and lead outreach.

Survey data shows notable gains in audience reach. ULIEA recipients represent a wide range of audience sizes, from 60 to over 40,000 participants each year. Two-thirds of program leaders report an increase in youth participants. Most

reported a 10-30% increase, one reported a doubling, and another reported a sixteen-fold increase in youth audience. Today, ULIEA recipients reach over 60,000 youth, combined. This outcome is all the more notable given the staff size of ULIEA recipients. Most winners have 1-2 full time staff and about half have 1-4 part-time staff.

In interviews, program leaders described many approaches to using the award to increase their audiences. For instance, one winner said:

“Not only were we able to expand regionally and geographically, but also develop that new programming with our regional partners, and in leveraging our other funding, to reach teachers across the province and to integrate that program into the training of pre-service teachers at our faculty of education. So we’re really trying to leverage and maximize our impact in every direction, in every way possible.”

In some cases, the award helps recipients engage groups who are often hard to reach. One award winner said the award enabled them to reach out to aboriginal groups in their region. Another said the ULIEA enabled them to retain youth who would otherwise be unable or unlikely to stay in the program:

“We’ve used the award to help launch this EPA grant-funded project, covering some of the unfunded portions of that project, and to offer stipends to some of our younger students in order to retain them in our program. Because we were finding that there was some attrition among more vulnerable students.”

Another winner remarked on the award's impact on scaling up their program and replicating in new areas. They said:

“I think that the award was really transformational for us. We could not have done the work that we did over the last year without that support, and we would not have had the reach that we had in that. So it truly leveraged us to another level of scale, and to really help us sort of move beyond thinking regionally to thinking a lot more holistically, and a lot bigger in terms of our confidence, capacity, and ability to help support and mentor other sites that were really interested in getting their own program off the ground.”

Finally, one award recipient described how the culture around the award contributed to their motivation to continue leading innovative programs:

“ULIEA is so much more about featuring the people who won and celebrating them and it’s silly little things, like each having our own hotel room, going out to dinner, or just the way that you’re talked to. It’s professional development for the soul. It’s rejuvenating us, to be able to do the work that we do.”

The ULIEA initiative increases winners’ ability to access funding, which in turn increases the capacity of their programs to provide E-STEM learning opportunities. Table 3 shows how winners reported substantial increases (from 1-2 points on a seven-point scale) in their assessments of funding opportunities before and after they received their award.

Table 3. Winners’ average assessment of access to funding and funders before and after receiving the ULIEA.

	Pre-Award	Post-Award
Has the ability to attract new funders.	5	6
Has strategic plans/techniques necessary for cultivating new funders.	5	6
Is on the radar for a large pool of potential funders interested in our programs.	4	6
Has developed clear ways of describing our innovations that appeal to a broad range of funders.	5	7
Is frequently promoted by our funders as a leading innovator in their portfolio of funded projects.	4	6
Has monitoring, transparency, and reporting strategies that appeal to a broad range of funders.	6	6
Is achieving effective growth in financial support from donors and granting entities.	5	6

Note. 1= Strongly Disagree and 7 = Strongly Agree.

Survey data and interviews show that UL’s reputation has a strong effect on organizations’ ability to fundraise, particularly

as it signals the program’s quality to philanthropies and federal agencies. One award recipient commented:

“It gave us that seal of approval to have a major organization such as UL to say that ‘hey, we’re a legitimate organization.’ It helped to give us credibility with local funders, so since then we’ve got money from individual donors. We’ve won a boost grant from the Delta Institute. So it’s really been a game changer for us, and even this year, we’re positioned to win some more monies from the Springboard Foundation, Engineers without Borders. Actually, today, I have a meeting with Chipotle because they want to do a little fundraiser for us as well. The award just opened up the floodgates in many ways for us.”

One ULIEA winner said the award affected their ability to develop partnerships and communications to increase funding:

“We ended up getting funding through NOAA through their Environmental Literacy Grant Program, and we were one of two sites in the country that received funding in 2017. And so, having the UL funding in place already – that actually helped us build those partnerships... We were able using the UL funds to build the relationships that we needed in order to apply and get the NOAA project funding.”

Award winners thought that the ULIEA initiative could increase impact in the area of leveraging funding in the future through the following ideas: a list of funders who share UL and NAAEE’s priorities, Department of Education Resources, updates on funding opportunities through the ULIEA newsletter and other communications, information about other types of funding from UL and NAAEE, and facilitating group grant submissions for large federal grants that could help winners combine their skills to work on a larger scale.

Reputation & Validation

Reputation is one of the hallmarks of the ULIEA initiative’s impact, according to both survey and interview data. In the survey, more than three-quarters of award recipients ranked reputation among the top three areas where they saw the strongest impact from winning the award. As apparent from Table 4, program leaders reported substantial increases (as high as 1 point on a seven-point scale) in their assessments of their organizations’ reputation.

Table 4. Winners’ average assessment of reputation before and after receiving the award.

	Pre-Award	Post-Award
Has a reputation as a leading innovator among our colleagues.	6	7
Has a reputation as a leading innovator in the community where we are based.	6	7
Has a reputation as a leading innovator across a broad spectrum of educational settings.	6	6
Has a reputation for youth leadership in problem solving in the community.	6	7
Receives a great deal of media attention for our innovative work.	4	5
Is sought out to present or share opinions about innovation and/or E-STEM learning strategies.	6	6

Note. 1= Strongly Disagree and 7 = Strongly Agree.

Changes in reputation worked in different ways, and often related to the award’s effect of validating a program. The ULIEA initiative promotes its values and priorities in award winners’ networks and communities. This effect is especially powerful for programs that are part of larger entities, such as universities, as they demonstrate the value of the program, and in turn increase its sustainability. One recipient said the award shows *“our local work is part of something bigger.”* Another organization commented in the survey, *“elevated EE and E-STEM awareness within our University community,”* and in the interview said:

“We have this award that shows that outside entities have recognized our work as well. I think that’s pretty big. We’ve won a number of awards over the years and just being able to be in this kind of elite group that is recognized in this way I think is really important to our long-term sustainability as a program.”

Award winners believe the names of UL and NAAEE confer a special quality or stamp of approval to their program. UL, as an international leader in safety, and with NAAEE’s status as a leader in the informal education field contribute to an award recipient’s reputation. One winner remarked:

“The fact that it’s a national award, and that not only UL, but also NAAEE, are involved is critical. It gives us, or any other winner, credibility. I think that’s huge in terms of how we go out and work with others, with our partners but also request other funding...The award made us a leader in the field. Before we were an organization with a good idea, after the award we’re leaders in the field.”

Recognition among peer organizations is an important outcome of winning the award, according to the interviews. Winners feel that their name is amplified in a way that’s different from being known in their own towns and cities.

“With our community, the fishing communities, the island communities that we serve, we’re already known among them for the good work that we do with them. Us getting the Innovative Education Award, I don’t think it matters to the fishermen or to necessarily the kids in the island school or things like that. We’ve already found ways to matter to those people with the work that we’re doing and that’s part of the reason that we got the award. So the award really has expanded our reach on the professional level.”

ULIEA recipients felt that there are opportunities for leveraging the boost in reputation even further through connecting award winners with conference opportunities to help bring these successful program models to a broader audience. Other suggestions were publications on the impact of EE and E-STEM on education, community resources, and the economy. More generally, program leaders asked for continued opportunities to share success stories or highlight their youth participants’ creative ideas, promoting winners to their partners and other contacts, and continued use of other media vehicles (e.g., the blog, video, and media releases).

Being Part of the ULIEA Network & a Community of Practice

The ULIEA initiative brings recipients into contact with other award winners, which influences organizations’ opportunities for improving program design, collaboration, and innovation. Interviews showed that many award winners think of ULIEA not only as an award, but also as a valuable invitation to a community of thoughtful leaders.

The seemingly simple process of convening winners in the same place is highly valuable to award recipients. They

applauded this approach of the ULIEA initiative, suggesting that a space for learning from each other is a unique opportunity for many award winners. One described the opportunity in this way:

“We’re all winners, so we’re not competing for anything else so we’re all there to think and share and grow, so it’s great again. That put everyone in a position of learning from each other, so they do things this way or that way, or we could innovate here and there is positive for each program. It’s like a think tank opportunity where we could really all benefit from it. I think it’s very important to continue having the summits with winners because it’s a select group of people who went through a lot of work to get there. It’s kind of an extension of the award because it is very rewarding to be able to have those kinds of conversations and see through your brain and your soul to these kinds of people.”

Another award recipient shared this sense of excitement about meeting with other members of the ULIEA network, saying, “If we all had a summit where we came together and we shared – we all shared – some of our skills with one another, how amazing would that be?”

Some programs benefit from sharing specific ideas and resources related to their specific regions, audiences, or program designs. One award winner commented:

“We were able to just even share resources, or, beyond that, just talk about the difficulties of barriers that come up with working with certain populations. Like trying to teach non-Indigenous peoples about traditional ecological knowledge. A lot of the programs face similar barriers – knowing that you’re not alone, and the work is still very important, and that people have the same challenges, I think, has been really impactful for me.”

Program leaders identified partnerships and collaboration as an effect of being part of the ULIEA network. Exposure to programs with shared values, yet diverse approaches, offers an opportunity to pool skills and resources, expanding E-STEM learning experiences for young people.

In the survey, about two thirds of award recipients said they had collaborated with another winner. Some had collaborated by presenting work at other winners’ sites and events. One program, for example, invited students from another ULIEA organization to their site to see real-world examples of

environmental justice. Similarly, one organization asked another group to present their work at a youth event. Some winners described being advisors on specific topics or products for colleagues at other ULIEA programs.

One award winner described the award community in this way:

“Being hooked in with a network of these very passionate awardees from all over the map, everyone focusing on education and the environment and sustainability, really expands our practice and helps us think about what we do in new ways. And in direct ways, we’ve made at least half a dozen inroads to partnerships with the other awardees. When you meet people of a feather like this, it creates new possibilities.”

Award winners also appreciate the exposure to other ideas and leaders from UL and NAAEE’s networks. One program leader said:

“Winning the award got us to the place where we really started thinking about, ‘We’ve been doing this for 35 years. What’s the next step?’ And some of that came from especially the meetings. UL has great speakers. Every time we go to a meeting they really bring to the table not only the other organizations that won, but also other consultants. And we are constantly learning from them and it really just stimulates your creative juices. I wouldn’t even call it a side benefit of winning the award, because I think it’s one of the major benefits.”

ULIEA: a Unique Award

ULIEA stands out among award winners as a unique and valuable process, from the application, to winners’ summits, to continued opportunities to interact with UL, NAAEE, and other award winners. In the interviews, one program leader compared ULIEA to other grants and funding opportunities in this way:

“Even though ULIEA is a really intensive award process, it’s more intentional and thoughtful than others. Sometimes I write a grant proposal and I send it into the universe and never hear from anyone ever again. It’s not strategic to do proposals that are cold like that, without a relationship. When we saw that there was an intentional, and really

supportive community behind this award, that’s what encouraged us to apply.”

Another program leader commented on interactions with UL and NAAEE:

“ULIEA seems like very much in line with what we do. It makes it that much more meaningful than a one year – or even three or four year – piece of funding where you never see the funders. In those cases, nobody comes to visit you and you’re really just a budget and a name on an application. So ULIEA is very special because it’s different.”

PRACTICAL SYNTHESIS

The *Blueprint for Success* report outlines Practical Synthesis as follows:

A variety of attributes combined to form the Practical Synthesis category, suggesting that E-STEM learning will focus on the integration of cross-curricular STEM education. Notable ways to achieve this synthesis are through teamwork, economics of the environment, and abandoning standardized testing.

The interview findings suggest that the ULIEA recognizes organizations that are creative in solving real world issues within their community. They reach across sector boundaries to develop new and innovative solutions to our world’s most pressing challenges, including but not limited to, environmental sustainability.

Supporting Innovation

While the ULIEA attracts strong, innovative programs, the initiative also supports continued innovation in E-STEM learning strategies for youth. For awardees, the award is a unique opportunity to experiment with new ideas, ideas that they had imagined for a long time but didn’t have the resources to realize, and also take risks with adaptations that might not work.

In the survey, awardees described a wide range of innovations they pursued as a result of receiving the award. Some award recipients enhanced existing strategies, such as new efforts to incorporate citizen science, a way of involving more youth and community members in collecting information for large-scale data sets. Another recipient used the funding

as an opportunity to involve sustainability professionals and experts from other “green fields” in their national programs. Meanwhile, other program leaders also used the award funds to provide professional development for staff and reinforce teaching practices with research.

Award recipients also experimented with entirely new strategies. One program said they added coding and machine learning to their program offerings. Another leader said their program used funds to pilot Arduino technology – an open-source electronics platform that can be programmed to inputs and produce outputs – with youth participants. Another program introduced new curricula on sustainable entrepreneurship, so youth can pursue businesses that also benefit their communities. One program also invested their award funds in developing their mission, values, and vision around diversity and inclusion.

Some award recipients experimented with in-depth learning experiences for youth through changes in instructor training and program design. One award winner experimented with *“including young people in all aspects of the program development, which in turn deepens students’ emotional connections as they learn.”* Another group trained staff to understand and support students’ self-efficacy.

Culturally responsive strategies were important to several award winners, where students’ multi-cultural backgrounds are a part of pedagogy and learning materials – an approach that research shows is more meaningful and accessible for young people. One said that these experiments helped better match students and instructors who share cultural identity or experiences, and another program developed a culturally responsive curriculum.

When considering the impact of these innovations on their youth participants and how they advanced youth learning, program leaders said they changed either their breadth of programming or the nature of youth engagement. For those focused on breadth, they said their reach has changed, and some have made a *“concerted effort toward geographic and socioeconomic diversity.”*

For those who spoke about the impacts of innovation on youth engagement, they said their programming quality has generally improved for youth. One program enhanced their

work within schools, while another built better infrastructure for serving youth. Another award winner developed youth leadership programs that enabled students to participate in international travel and present their research to both peers and adults. One program expanded students’ work to *“not only think about these challenges, but design innovative solutions to them.”* One leader said their most notable impact on youth learning has been *“program alumni who have chosen career paths based on interests that were ignited by our program.”*

Similarly, interviews explained how the award not only recognizes programs for their innovation, but also scaffolds ongoing innovation. Program leaders identify the award structure as the mechanism that promotes experimentation. One program leader encapsulated this idea, saying:

“I think the way the award is presented, it’s really encouraging, not only supporting our organizations that are innovative, but rewarding and also encouraging the continued need to be innovative. Putting trust in our mission, giving us this money and saying, ‘we trust that you’re going to do something great with it,’ instead of submit a detailed budget for how you’re going to do something. It’s a different approach.”

One group described how the award enabled their team to creatively pilot a program to examine a variety of strategies for solving E-STEM challenges in their region. This individual said:

“Our schools learning from other schools is where our strengths really shine. We have six to ten very focused environmental STEM challenge grants at the schools. One of them is a watershed-based example. One of them is a schoolyard habitat. One of them is a fisheries example. Another one is a schoolyard forest example. So we have very diverse set of projects open through this challenge. At the end of a year, we’re going to have some really cool case studies that really directly make the connection between the environmental STEM and how it overlays place-based education.”

The ULIEA also inspires long-standing programs, motivating them to continue to adapt and experiment with their learning strategies. One leader of an established program remarked:

“The direct impact on the students is that it gave everybody – the regional coordinators, the volunteers, the funders, the partners – a shot in the arm and a reason to continue. I think the hardest thing about America is everyone wants shiny and new. So when they hear a program has been around for 25 years, they’re like, ‘Well, you got to re-invent yourself. You got to start something over.’ They only want new programs, new research. To get the award was validating because programs with infrastructure can be continually re-inventing themselves and can be continually improving, but we don’t need to constantly throw out programs and then start new programs. And so I would say that it’s helped us on our road to continuing to reach more students and just continue in general.”

Working across Disciplines

The ULIEA initiative targets programs that take an interdisciplinary approach to learning, with particular emphasis on inclusive definitions of environment and thoughtful uses of engineering and design to tackle real world issues. Award winners had diverse understandings of and approaches to environment, whether they focus on natural or built environment, or a combination of different aspects of environments in their region. Likewise, each organization has a different degree of focus on science, technology, engineering, and math.

In the survey study, half of program leaders said that receiving the award changed their conception of E-STEM. For some, the ULIEA community’s discussion of E-STEM helps them see their program’s work in the landscape of global dialogue on sustainability and equity. One program leader wrote that E-STEM is:

“Building capacity for youth leadership development, civic engagement, and framing using the United Nations Sustainable Development Goals is a critical part of E-STEM. Within our own work, we are intentional about real project-based learning that works towards action competencies – in other words, having students work on real projects that work to improve their schools and communities. I also believe that E-STEM should explicitly work towards promoting diversity and equity across all programming.”

Others said that the award has helped them better articulate the work they do in their programs. One person commented

that the award “put language behind concepts that have always been embedded in the program model (e.g., E-STEM as a platform for social/emotional learning).”

REAL CONNECTIONS

The *Blueprint for Success* report outlines Real Connections as follows:

Making connections to the real environment was a prevalent theme, indicating that physically spending time in the natural environment was extremely important and a tried and true method of engaging youth in E-STEM. Participants in all of the research efforts called attention to this category.

Below are examples of how ULIEA recipients have leveraged the award to make real connections within the communities in which they live, work, and serve.

Connecting People with E-STEM: Community Engagement & Outreach

Award recipients already excel in providing E-STEM learning opportunities, and the ULIEA initiative deepens programs’ ability to connect their community with E-STEM experiences. Overall, respondents felt solidly engaged with their communities and partners, especially after winning the award (Table 5).

Table 5. Winners' average assessment of their programs' engagement with communities and partners.

	Pre-Award	Post-Award
Is sought out by other community or nonprofit leaders to provide leadership, knowledge, or advice on community-level issues.	6	7
Spends sufficient time interacting and collaborating with community members, participants, and leaders to understand the needs of our audiences.	6	6
Is effective at leveraging partnerships to achieve our mission and goals.	6	7
Spends the right amount of time on partnership work to enable implementation of our core goals.	5	6
Focuses efforts on partnership work or networking that aligns to our mission.	6	7
Is capable of bringing new strategic partners into successful collaborations that help us achieve our mission.	6	7
Regularly assesses the results of key partnerships, alliances, or participation in networks.	5	6

Note. 1 = Strongly Disagree and 7 = Strongly Agree.

Adding detail to these ratings, organizations described how they've strengthened connections to E-STEM by focusing on global issues and partnering with bigger organizations. Interviews have corroborated these results, showing different ways that the ULIEA initiative has helped programs connect their communities to E-STEM issues and solutions. One program described how the impact of purchasing a bus with ULIEA funds helped their community connect with learning opportunities:

"The area that we're in is very rural, and because of that there's not a lot of public transportation. Oftentimes, we have families with both parents working so that they share one vehicle, or we have multi-generational families in one household that are sharing one vehicle, or sometimes, even multiple families who just have one vehicle. They don't have the means of transportation. By purchasing the bus, the capacity and the people that we're able to reach has increased, which has been a really, really cool thing."

That program leader went on to characterize the bus as a *"community builder,"* where families from the area connect with each other before and after attending an activity.

Some program leaders reiterated the strength of their program design as meaningful and important approach to connecting their communities with E-STEM. In the case of one program winner, they focus predominantly on environment in an urban area. They said:

"We look at environmental education as a vehicle to create opportunities for youth in our community. In our community, there's literally thousands of vacant lots filled with trash, heroine needles. People hide guns in vacant lots, so they're really eyesores in the community. We're trying to think, 'how can we do something that will change that?' We saw environmental education as a means to an end. That's like everything we do, it has this real-world application because that's just the environment we're operating in."

Similarly, another program leader spoke about how their constituents are drawn to E-STEM because of critical community needs. In this case, this program connected design to environmental issues:

"We've noticed over time that educators and kids would often naturally gravitate towards environmental projects. The kids were particularly interested in making contributions to their world and then particularly to their local communities. Often that would involve something that was related to the environment. Especially some of these communities, they're struggling with a lot of environmental degradation issues, environmental issues that need to be addressed that aren't being fully addressed in any of our communities, frankly. Given the opportunity, the educators and kids would gravitate towards environmental responsibility projects."

Thinking about other ways that the ULIEA initiative could support community engagement and partnerships, award recipients suggested that they would benefit from assistance with developing partnerships at the national or international levels; continuing to engage UL engineers in mentorship, outreach, community engagement, and club participation; and an opportunity to connect with other organizations like regular calls or webinars.

EVALUATION

To understand the interest in and capacity for evaluation, we asked program leaders about their experience with evaluation at their organization before and after receiving the award. Table 6 shows that awardees started with an above average commitment to evaluation, which increased moderately following the award.

Table 6. Winners' average assessment of commitment to evaluation.

Statement	Pre-Award	Post-Award
Our senior leadership prioritizes evaluation and routinely dedicates resources to it.	5	6
Our program dedicates sufficient resources for evaluation.	5	6
We openly share evaluation findings with key stakeholders.	6	6
We make use of evaluation data for critical strategy and budget decisions.	5	6
We apply findings from <u>external</u> research to support decisions regarding strategy or financial choices.	5	6
Our evaluation has clear, systematic follow-up processes.	4	5

Note. 1= Strongly Disagree and 7 = Strongly Agree.

Implications & References

The evaluation of the UL Innovative Education Award has shown that UL and NAAEE have built a unique opportunity for program leaders, youth participants, and the larger E-STEM field. Here we describe the larger implications of this work, in line with the evaluation questions we pursued in this study: How does ULIEA support innovation in the field of E-STEM?; How does this award build capacity in the field of E-STEM innovation?; and How are organizations, groups, and people influenced by the program, directly or indirectly? We also refer to the original research that built the foundation for this award, discussing how ULIEA addresses the gaps identified by that study (Fraser et al., 2013). The findings from this evaluation cycle (strongly) suggest that the beneficial return to youth and their communities far exceeds the initial investments made by both UL and NAAEE.

Supporting Innovation

By recognizing and supporting star leaders in the E-STEM field, ULIEA in turn fosters in them the confidence and resources to further experiment with innovative programs and community outreach. As a result, the initiative not only rewards innovation but also *sustains* innovation. Through annual summits and ULIEA networking avenues, ULIEA program leaders from a variety of backgrounds come together to share ideas and form new collaborations among themselves. These collaborations are not only valuable to leaders personally and professionally, but they also help programs further leverage their resources. Through collaboration with other innovative organizations throughout North America, program leaders are better positioned to provide innovative, creative, and geographically expansive learning experiences than they might otherwise – this result serves as evidence that this work improves interdisciplinary collaboration within the E-STEM field (Fraser et al., 2013).

Building Capacity

The evaluation results demonstrate how ULIEA is a program that builds capacity for winners in a variety of ways. ULIEA is an exemplar award program that empowers leaders in the

field of E-STEM through organizational support, as well as offering critical opportunities for professional development and professional learning. This support stimulates their ability to find new funding sources, improves outreach capacity, and provides a community of practice among like-minded professionals through thoughtful and intentional systems of support. This award has clearly addressed a lack of funding for operations among non-profit E-STEM programs, and a lack of relevant professional development opportunities (Fraser et al., 2013).

Benefitting the Field

While the ripple effects of ULIEA within the larger E-STEM field are yet to be realized, it seems that this initiative is raising the profile of E-STEM as a powerful approach for engaging young people. ULIEA has attracted and awarded programs that did not formerly identify as E-STEM, thereby broadening the reach of the field to a wider and more diverse audience. Additionally, the reputation of this award program may also position UL and NAAEE as leaders in both the E-STEM field, and also for this type of funding model. ULIEA can serve as a leader among other corporations and professional associations that are interested in funding innovative strategies for effecting change in communities, improving learning opportunities for young people, and strengthening pathways to careers.

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Methods

We used a multi-methods approach to this evaluation, which included narrative-based interviews with program leaders and surveys with program leaders. NAAEE also interviewed students who participate in programs that received the 2017 ULIEA. That method is described in the companion report, *UL Innovative Education Award: Stories of Youth Experiences* (Norlander, Maertens, Flinner, 2018).

NARRATIVE-BASED INTERVIEWS

In order to better understand winners' experience with the award and how it has impacted their program, we conducted narrative-based interviews with the 15 ULIEA recipients for award years 2015-2017. This style of interview allows for the participant to share their voice and experience in a more authentic manner than a more traditional structured or semi-structured interview. By providing participants with open-ended question prompts, they were allowed to elaborate on each prompt from their experience and perspective.

Interviews ranged in length from 25 minutes to just under one hour for a total of 556 interview minutes (9.3 hours). All interviews were recorded, transcribed, and coded for common and emergent themes as will be further outlined below.

This method of evaluation addresses the overarching evaluation questions while also allowing participants to say in their own words what the biggest impact has been on their organization, program, audience, and context since receiving the ULIEA award. This feedback helped inform the survey questionnaire and design. Hand in hand, this evaluation strategy brings to light a greater understanding for ULIEA impact for years one through three.

Interview Prompts

The following question prompts were asked during our interview time with each ULIEA recipient, supplemented with clarifying questions as needed:

"To begin, tell me about...

- Your experience with ULIEA in general and what's changed for you and your organization since you received the award.
- Since ULIEA, what has been the biggest change you've noticed in the participants you serve? Or, the community in which you work?
- What prompted/motivated you to apply for the award?
- What are the most helpful aspects of ULIEA?
- What about ULIEA could be improved?"

Many of these questions emerged from the 2018 Chicago Leadership Summit based on feedback from ULIEA recipients and the UL & NAAEE team members.

In the report, the evaluation team removed natural transitional phrases (such as "like", "you know", etc.) to improve readability. Quotes were not edited in ways that changed meaning.

PROGRAM LEADER SURVEYS

We also asked the 2015-2017 ULIEA recipients to participate in a structured survey to understand how this method might yield different information and be used in ongoing monitoring in the future. This survey included six modules with 27 cumulative pre/post items. Each of these pre/post items was used as a retrospective pre-post strategy to ask program leaders to compare their programs currently to the point in time right before they received the award. The survey also included 27 open-ended questions in order to dig deeper into the potential impact of the awards on recipient organizations and ways in which ULIEA can further support winners' missions.

These surveys were available online via Qualtrics, accessible from any browser, for three weeks in June 2018.

Respondents were contacted directly via email with a link to the survey for both initial recruitment and subsequent requests to complete the survey.

Instrument

We designed the survey instrument in consultation with UL and NAAEE. The survey used an established non-profit inventory (Corporation for National & Community Service, 2017) for inspiration on questions and topics that might be relevant to their context.

The survey included six modules that intended to measure the following:

1. E-STEM – How program leaders felt that the ULIEA has had an impact on their understanding of the concept of E-STEM.
2. Youth Education and Engagement – How award recipients felt that the ULIEA had an impact on their capacities with respect to diversity and effectiveness of their youth education.
3. Access to Funding and Funders – How program leaders felt that the ULIEA had an impact on their capacities and efficacy in attracting continued and new funding.
4. Reputation – How leaders felt the ULIEA had an impact on their social status and capital with key stakeholders and audiences.
5. Community and Partner Engagement – How program leaders felt about the award's impact on their capacities and intentions to effectively collaborate with allies and partners
6. Evaluation – How leaders felt that the award had an impact on their focus on, resourcing, and use of research and evaluation.

Analysis

The online surveys were written in, served by, and recorded by Qualtrics. We conducted analysis in R. Analysis included descriptive statistics to provide context and enable data exploration. The survey received too few responses for statistical analysis. Further, we relied on conceptual summary analysis of program leaders' textual responses. The survey received too few responses for computational text analyses.

Participants

Program leaders from ten organizations that received an award participated in the survey. Five organizations did not respond or provided incomplete data.

Appendix A: Impact Areas Mentioned in Interviews

Below is a table of the highest frequency codes. It helps give a sense of what was most salient to ULIEA recipients based on their experience with the above prompts. The frequencies reported for each pre-determined and emergent code represent the number of times they were mentioned both within an interview and across all 15 interviews.

Table 7. Interview themes with highest code frequency.

Theme	Frequency (Interviews)	Frequency (within & across)	Frequency (per minute)	E-STEM Report Indicators*
Capacity Building	15 (100%)	69	1:8	PD
organizational	11 (73%)	29	1:19	PD
outreach	12 (80%)	32	1:17	RC
Network Building	15 (100%)	89	1:6	PD
ULIEA community	15 (100%)	53	1:10	PD
annual summit	12 (80%)	22	1:25	PD
Validating	12 (80%)	22	1:25	PD
external	12 (80%)	20	1:28	PD

* PD=Professional Development; RC=Real Connections; PS=Practical Synthesis

Appendix B: Stories of Youth Leadership

Table 8. Verbatim stories of youth leadership since programs received their ULIEA.

Story of Youth Leadership
Native youth engaged in our programs have seen how their school work connects to career options that interest them and allow them to practice their cultural values in protecting the environment. I don't have a specific story at the moment.
Since receiving the ULIEA, we ensure that we integrate environmental principles, E-STEM, and sustainability in every possible facet of our program, especially the annual theme. The 2018-2019 program cycle focuses on city resiliency in the face of natural disasters. We've found that our annual themes provide a gateway to our young participants getting hands-on experience with important, real-world issues. For example, when we focused on waste management, a team from Iowa designed futuristic, sustainable waste reduction and recycling practices in their future city and was inspired to take real, actionable change in their local community. They reached out to a hotel development firm and pitched their innovative sustainability-related ideas that they felt strongly should be included in their community's new hotel. The developers were impressed and implemented several of the kids' ideas into their plans. Our program truly prepares kids not only to be the drivers of tomorrow, but real change-makers today.
At this point, I think it mainly gives us the stamp of approval to get more resources to create a higher quality program. I know that a youth summit was planned, but to date we haven't had the opportunity to attend a youth summit so the benefit has mainly been financial.
We have consistently worked with our staff to prepare them to have conversations with participants about environmental challenges and solutions, but since our work with ULIEA we have added an additional focus on issues of equity and inclusion in environmental fields and leadership development. One of our staff members took our High School Marine Biology program and re-engineered it through the lens of climate justice, creating a powerful theme for the students throughout the week, resulting in some amazing project presentations and reflections from the students.
Our work is centered around helping young people not only learn about climate science, global and local impacts of climate change, and solutions but it also helps young people to be part of the solution on climate change. During the period of ULIEA award, we had student leaders LEAD climate workshops in Germany and Sri Lanka; develop and teach a youth climate leadership retreat; form a youth advisory board; present to local communities and leaders. We also had three of our alumni organize youth climate summits (for high school students) at their colleges this year -- all in New York State and one in North Carolina. Recently we had students present at the village board meetings in Saranac Lake and Lake Placid -- this is after several years of work -- to finally pledge to be a NYS Climate Smart Community AND include youth in the next step of that certification process. Our program includes youth at all levels of decision making and planning program elements - allowing them to always have a voice at the table.

Story of Youth Leadership (continued)

By giving them a broad background of E-STEM and current critical issues it gives students the knowledge and the skills to be leaders in their schools. It also encourages them to major in the STEM fields to become the leaders of the future. If we have a story we will forward it to you.

Post-program surveys reveal that students exhibit a strong environmental ethic after participating in our program. Students often report that they are making more environmentally-conscious decisions and they communicate that ethic to their families and peers. In the long-term, students demonstrate environmental leadership ability by choosing post-secondary and career opportunities in the field.

The ULIEA Judges said with regard to our program, "We think it's so important that this STEM learning has specific advocacy actions that go with it." Since receiving the award, we are constantly on the lookout for current civic engagement opportunities that we can include in our existing curriculum in a meaningful way. A few weeks ago, we realized an amazing civic opportunity. Students from almost all of our partner schools, as well as others, came to City Hall for a Youth Rally to Ban Foam. Students from every school had the opportunity to speak and share their own viewpoints at this key municipal venue with the Mayor and City Council Members in attendance and on an issue which they had all studied in depth. Both students and teachers were ecstatic to be a part of this rally. Student comments following the rally included, "This was the first day that I liked going to school." Students now have a personal connection to top city leaders, including their Mayor, and a sincere interest in how policies are made in NYC.

We have not completed and disseminated the new Green Guide yet. This will happen this fall. However, our hope is that the new guide will inspire kids to engineer solutions to needs in their communities, including protecting the environment, making children's and older people's lives better, improving their schools, and helping people stay healthy and safe. The guide will introduce kids to engineering and invention in fun and creative ways. We hope that this will spark kids' early interest in engineering and perhaps lead them to consider careers in the field. In addition, our hope is that when kids are given opportunities to explore and design age-appropriate solutions to environmental issues in their own communities, they develop a personal investment in protecting the planet and making a difference in their communities, which carries through to adulthood.

First and foremost, our region is often characterized (internally and externally) as an economically poor and impoverished region, yet rich in Great Lakes and natural resources AND inspiring people. Many youth may find it difficult to see themselves 'getting out of the area' and going to college or in a STEM/science career. Yet, this E-STEM conversation has helped to students to engage, find value, and contribute value to their local community and natural resources - often working alongside Great Lakes and natural resources scientists and professionals. Hopefully they take pride in northeast Michigan (maybe not feeling they NEED to leave), recognize they have STEM skills/ability (college/careers might be an option), AND that some of those STEM careers in Great Lakes and natural resources are actually available in their own backyard (they could become a science professional and plausibly live in a region where they grew up and learned to love). Also, this has helped our science/research/management community partners engage more strategically and meaningfully with schools, educators and youth through the E-STEM focus of our program's network over the past couple years ...some really great school-community partnership connections made!



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