



Project LIFT Data Summary

2021-2023 Novel Engineering Results

Indiana University



201 North Rose Avenue, Bloomington, IN 47405



Introduction

During the 2021-2022 and 2022-2023 academic years, faculty from Indiana University's (IU) School of Education collaborated with the Readable English literacy program team to provide professional development workshops and follow-up classroom support for schoolteachers throughout Indiana as part of Project LIFT, an Indiana Department of Education (IDOE) Learning Recovery program. The goal of Project LIFT is to help teachers improve interdisciplinary teaching and learning by infusing science, technology, engineering, and math (STEM) into the Readable English literacy program. For two years, the project brought together teams of educators from the same school districts who teach grades 2 through 8 and are participating in the Readable English literacy program, to explore STEM and literacy connections and introduce them to Novel Engineering. Novel Engineering is a research-based approach to STEM education that aims to improve student understanding of engineering (e.g., who engineers are and what engineers do). Novel Engineering leverages literature to provide rich contexts for learning which creates bi-directional benefits - simultaneously improving literacy and STEM education. In Novel Engineering, students identify problems faced by characters in popular novels and passages and then design, build, and improve solutions for them. Novel Engineering was developed by the Center for Engineering Education Outreach (CEEO) at Tufts University. This report summarizes findings from (1) teacher professional development workshop evaluations, (2) surveys of students who participated in the program, (3) participating teacher interviews, and (4) Readable English coach interviews.

**Novel Engineering
Teacher Professional
Development
Evaluations**

Data Summary

“Our teachers and students absolutely love the Novel Engineering projects they are working on!” – Melanie Nelson, Readable English Teacher Coach

During Fall 2021, faculty from Indiana University’s (IU) School of Education collaborated with Readable English to provide professional development workshops for Project Lift’s participating educators on the Novel Engineering program and how Novel Engineering can be incorporated into their classrooms. The workshops also provided teachers with insights on how to get students to work collaboratively and utilize design thinking in their classes.



To accommodate teacher schedules, three separate one-day workshops were offered in Fall, 2021. The participating teachers attended one of the following dates: September 23rd, October 7th, and November 19th at sites located throughout the state. After the workshops, follow-up classroom support for the teachers was provided by the participating IU faculty members and the Readable English staff. Classroom support included planning, modeling, or co-teaching lessons. All participating Project LIFT teachers were provided with classroom materials, supplies, and textbooks to support Novel Engineering initiatives in their classrooms.

All participating teachers completed post-workshop teacher evaluations. The evaluations provided information about the appropriateness, utility, and transferability of specific activities within the workshops into each educators’ specific disciplines of teaching. This report summarizes the findings from the evaluations and compares them where appropriate.

Respondent Information

The post-workshop evaluation was completed by 30 of 36 educators who participated in the workshops (some of the teachers had to leave the workshops early and did not complete the evaluations). Of the 30 respondents, 11 identified as middle school (grades 6-8) teachers (36.6%), and 19 identified as elementary (grades 3-5) teachers (63.3%).

The 30 teachers were from four rural school districts in Indiana including Bloomfield School District, Barr Reeve Community School District, Mitchell Community Schools, and North White School Corporation.

Summary of Findings

Workshop Evaluation Responses

The workshop evaluations asked respondents to rate their level of agreement (1= strongly disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree, 5 = strongly agree) with four evaluative statements. Overall responses for the program are reported below:

- For the statement “The workshop objectives were clearly stated” the participating teachers responded with a high average level of agreement for the professional development program (average 4.90).
- For the statement “The presenters were well prepared” the participating teachers responded with the highest average level of agreement possible for the professional development program (5.00).
- For the statement “The information and activities were relevant to my grade-level curricula and classroom practice” the participating teachers responded with a high average level of agreement for the professional development program (4.80).
- For the statement “The workshop met my expectations” the participating teachers responded with a high average level of agreement for the professional development program (4.80).

Respondents were also asked to indicate their overall rating of the professional development workshop using a 5-point scale (1 = poor, 2 = good, 3 = good, 4 = very good, 5 = excellent). Overall responses for the program are reported below:

- **86.6% (26 of the 30) of the participating teachers rated their training as excellent, 13.3% (4 of the 30) rated their training as very good.** No respondents rated their training as good, fair, or poor.

Workshop Evaluation Qualitative Feedback

On the post-evaluation survey, the participant teachers were asked to explain what aspects of the workshop they found most valuable. 30 out of 30 respondents addressed this request. The responses were coded and grouped into the following themes and frequencies. Those are presented below along with sample comments from the respondents.

- Exemplar classroom activities and resources (43.3%, 13 of 30 respondents)
 - *I really enjoyed the hands-on activities and demonstrations.*
 - *The hands-on activities were helpful for me to visualize what the process would look like in the classroom.*
 - *I loved the collaborative brainstorming ideas and activities.*
 - *I liked that we started with the basic background of engineering.*

- Curricular connections (36.6%, 11 of 30 respondents)
 - *I love working literacy into STEM. It gives it a purpose.*
 - *I appreciated the different ways that STEM was tied to content.*
 - *The idea of integrating novels with the engineering design process. Super excited!*
 - *It was exciting to see ELA connected to engineering projects which is something that I have not seen before.*

- Pedagogical strategies (20%, 6 of 30 respondents)
 - *I appreciated the hands-on experience to get the full effect of the program.*
 - *I love the teamwork aspect of the activities.*
 - *Making learning fun.*
 - *Learning how to increase collaboration and optimize lessons were the most valuable aspects of the workshop.*

On the post-workshop survey, the participant teachers were asked to explain how they intend to use the information, resources, and activities from this workshop when they return to the classroom. Again, all 30 teachers addressed this request. Some of the teachers explained several ways they would use the products of the workshops. The responses were coded and grouped into the following themes and frequencies. Those are presented below along with sample comments from the respondents.

- Implement activities/lessons/concepts (50%, 15 of 30 respondents)

- *I will begin using Readable English and start integrating hands-on activities related to literature.*
- *I will go straight to work implementing Novel Engineering and design thinking in my classroom.*
- *I plan to implement all of the activities used today including the use of problem tracking and empathy maps.*
- *I am excited to implement novel engineering!*
- Curriculum development (40%, 12 of 30 respondents)
 - *I am planning to combine Novel Engineering with the novel *Because of Winn Dixie*.*
 - *I am excited to start using the activities provided and then picking something new all on my own.*
 - *I can incorporate this with all of the novels I read in my classroom – which will increase engagement across the board.*
- Share information with peers (10%, 3 of 30 respondents)
 - *I will use this information to help support other teachers.*
 - *I would like to introduce the information with my teacher team.*

Lastly, on the post-workshop survey, the participant teachers were asked if they have any additional comments. A sample of their comments are below:

- *It was very informative!*
- *I loved the ideas shared today. I am excited to increase my students' engagement in our novel studies with these strategies.*
- *Super engaging and useful. Awesome!*
- *I really appreciated the in-depth details on teaching STEM.*
- *This is the best PD I have been to in a long time. Excellent presenter, strategies, and support provided.*
- *I loved it!*

Novel Engineering Student Survey Results

Data Summary

The research team distributed pre-post surveys – utilizing previously created valid and reliable surveys - to all Project LIFT students seeking information on their familiarity with engineering (e.g., who engineers are and what they do) and to gauge student interest in, and awareness of, engineering as a future career (e.g., do you like to figure out how things work?). This report summarizes the findings from the student pre-post surveys conducted at the beginning and end of the academic year of 2021- 2022. The complete survey and responses for the quantitative and qualitative portions of the surveys are included here. Numbers within parentheses indicate the number of respondents corresponding to the categories or responses described.

Respondent Information

- The pre-survey was distributed to the students at four rural school districts in Indiana. The districts included Bloomfield School District, Barr Reeve Community School District, Mitchell Community Schools, and North White School Corporation. The pre-survey was distributed in October 2022 and the post-survey was distributed in May 2022.
- All students received the survey invitation via email, 102 responded to the pre-survey, and 32 responded to the post-survey. (The low post-survey response rate may have been due to the fact that many of the post surveys were provided near the end of the school year.) Identifying student information made it possible for the research team to pair student pre and post surveys.
- A majority of respondents were girls, 57 (58%).
- Among all respondents, 48 (48%) indicated that they were in the 4th grade; 13 (13%) indicated that they were in the 3rd grade; 31 (31%) stated that they were in 5th grade; 7 (7%) indicated that their child is in the 1st grade.

Summary of Findings

Respondents were asked which subjects they like in school: Science, Math, ELA, Computer Science, and Social Studies. Most respondents reported similar choices in both the pre and post-surveys. The full results of this question are included at the end of this report; the choices with the highest frequencies are reported below. Please note that respondents could select more than one option. Thus, percentages sum greater than 100%.

- 33% percent of students liked the subject Math, while 20% of students liked the subject science. 20% of students liked Computer Science.
- Respondents were asked to rate their experiences at school. Most students expressed “somewhat hard” (70%).
- Students were asked if they studied any of the following subjects in school or after school: engineering, computer science, programming, robotics, coding. Most respondents reported that they had studied computer science (27%) and coding (22%) in or after school. Only 15% of students stated that they have studied engineering in school on the pre-survey.
- Students were asked about their use of engineering in their everyday lives. Complete results of this question are included at the end of this report; areas with the highest and lowest levels are highlighted here.
 - Among 101 respondents in the pre-survey, more than half of them reported that they *did not* use engineering every day (61.62%).
 - In the post-survey, most of the students (75.25%) reported that they *did* use engineering in their everyday activities.
- Students were asked to answer the statements that best describe how they feel and think about engineering.
 - In the pre-survey, most students (48%) reported wanting to be creative in their future jobs.
 - In the post-survey, after the implementation of Novel Engineering in their classrooms, most students (47%) reported that they wanted to know how to use math and science together to help them invent useful things.
- Students were asked to rate their level of agreement with several statements about 21st Century Skills that can be acquired through Novel Engineering. Full results of this question are included at the end of this

report; statements with the highest and lowest levels of agreement are highlighted here.

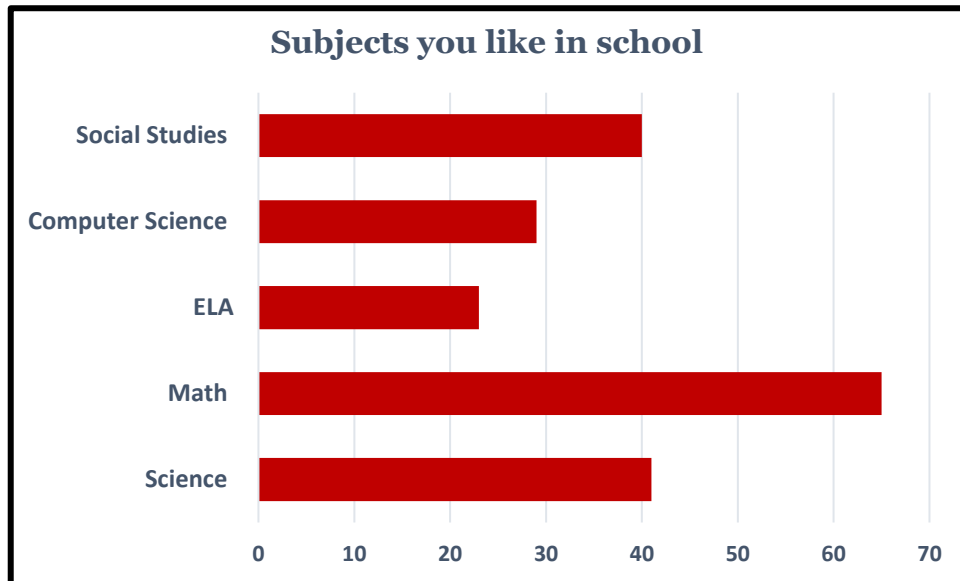
- In the pre-survey, most students agreed (44%) or strongly agreed (46%) that they like to help others do their best. Some students disagreed (11%) that they can work well with all students.
- In the post-survey, after the intervention of Novel Engineering, most students either (61%) strongly agreed or agreed (32%) that they like to help others do their best.
- Students were inquired about what type of job(s) they will have when they grow up.
 - In the pre-survey, most students (71%) answered yes, they know what job they will have when they grow up, and some (20%) answered they do not know yet about what job that they will have when they grow up.
 - In the post-survey, after the intervention of Novel Engineering, most students (67%) knew what type of job they will have when they grew up. Only a few (30%) of students did not know about future jobs.
- Students were asked to select the activities they think they might be interested in as part of their job in the future.
 - In the pre-survey, most students were either (43%) interested in helping others improve their physical or mental health or (41%) in helping to protect the environment.
 - In the post-survey, most students either (37%) responded they were interested in thinking about new things and better ways to do things or (37%) inventing new things after the novel engineering interventions.

Qualitative Responses

- Respondents were asked to provide how they use engineering in their everyday lives. The students provided the following answers to this question:
 - *“I fix my controller and headset and mic for my Nintendo switch.”*
 - *“I use engineering in my everyday life because I bake and cook a lot so I am using microwaves and ovens, etc. I also like coding, so I do that at least once a day. I also love math problems, and most of my homework is problem-solving and some games.”*
 - *“I work on a Minecraft computer, and we build it with screws and motherboards.”*
 - *“I like to build things.”*
 - *“Engineering has math in it and I use math every day even when I'm not in school.”*
 - *“I use Engineering by living in my house.”*
 - *“Because I build LEGOs every day”.*
 - *“Yes, because I use engineered projects every day. I have to engineer ways to stop my brother from annoying me.”*
- Respondents were asked to list the jobs that they want when they grow up. Students listed the following:
 - *“I want to be an engineer”.*
 - *“If I can do any job when I grow up, it would be a nurse.”*
 - *“If I could have any job I want when I grow up, I would want to be a teacher like my dad. (For right now a least).”*
 - *“I would want to be a mechanic.”*
 - *“If I can do any job in the whole world, it will be a chef.”*
 - *“I want to be a doctor.”*
 - *“A computer person like my dad.”*
 - *“If I could do any job when I grow up I would love to be an eye doctor and own my own business. I think it would be very fun to work with big machines and see and feel new experiences.”*

Survey Questions and Data

Subjects you like in school?



Answer	Count n=102 (Post-survey)	Percentage	Count n=32 (Post-survey)	Percentage
Science	41	21%	18	24%
Math	65	33%	22	29%
ELA	23	12%	10	13%
Computer Science	29	15%	10	13%
Social Studies	40	20%	21	16%

How hard is school for you?

Answer	Count n=102 (Post-survey)	Percentage	Count n=32 (Post-survey)	Percentage
Very Hard	5	5%	1	3%
Somewhat Hard	70	69%	24	75%
Not hard at all	27	27%	27	22%

Have you studied any of these subjects in school or after school?

Answer	Count n=102 (Post-survey)	Percentage	Count n=32 (Post-survey)	Percentage
Science	68	27%	24	22%
Engineering	38	15%	18	16%

Computer Science	30	12%	14	13%
Programming	34	13%	17	15%
Robotics	29	12%	15	14%
Coding	55	22%	22	20%

Do you use Engineering in your everyday life?

Answer	Count n=102 (Post-survey)	Percentage	Count n=32(Post-survey)	Percentage
Yes	39	39%	8	25%
No	62	61%	24	75%

Please rate the statements that best describe how they feel and think about engineering listed below:

Pre -Survey

Answer(n=102)	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I like to imagine making new products.	7%	13%	18%	42%	21%
If I learn engineering, then I can improve things that people use every day.	6%	9%	17%	42%	26%
I am good at building or fixing things.	8%	6%	31%	37%	19%
I am interested in what makes machines work.	11%	16%	24%	30%	20%
Designing products or structures will be important in my future jobs.	9%	19%	26%	22%	25%
I am curious about how electronics work.	13%	17%	11%	35%	22%
I want to be creative in my future jobs.	2%	6%	16%	28%	48%
Knowing how to use math and science together will help me to invent useful things.	6%	13%	20%	34%	27%
I believe I can be successful in engineering.	13%	10%	22%	30%	26%

Post-survey

Answer(n=32)	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I like to imagine making new products.	3%	13%	29%	23%	32%
If I learn engineering, then I can improve things that people use every day.	3%	10%	13%	29%	45%
I am good at building or fixing things.	7%	3%	17%	43%	30%
I am interested in what makes machines work.	13%	20%	13%	23%	30%
Designing products or structures will be important in my future jobs.	10%	17%	30%	17%	27%
I am curious about how electronics work.	7%	17%	21%	24%	31%
I want to be creative in my future jobs.	10%	6%	10%	42%	32%
Knowing how to use math and science together will help me to invent useful things.	0%	10%	13%	30%	47%
I believe I can be successful in engineering.	10%	13%	20%	27%	30%

Please rate to rate their level of agreement with several statements about their 21st Century Learning.

Pre-survey

Answer(n=102)	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I can lead others to reach a goal.	7%	3%	20%	42%	29%
I like to help others do their best.	2%	1%	7%	44%	46%
In school and at home, I can do things well.	2%	2%	14%	52%	31%
I respect all children my age even if they are different from me.	2%	1%	13%	43%	40%

I try to help other children my age.	2%	1%	15%	41%	41%
When I make decisions, I think about what is good for other people.	1%	6%	24%	46%	23%
When things do not go how I want, I can change my actions for the better.	3%	8%	22%	40%	27%
I can make my own goals for learning.	1%	6%	12%	52%	29%
I can use time wisely when working on my own.	2%	7%	21%	41%	30%
When I have a lot of homework, I can choose what needs to be done first.	5%	8%	13%	37%	37%
I can work well with all students, even if they are different from me.	5%	11%	21%	32%	30%

Post Survey

Answer(n=32)	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I can lead others to reach a goal.	0%	3%	21%	41%	34%
I like to help others do their best.	0%	3%	3%	32%	61%
In school and at home, I can do things well.	0%	0%	7%	43%	50%
I respect all children my age even if they are different from me.	0%	0%	3%	40%	57%
I try to help other children my age.	0%	3%	0%	47%	50%
When I make decisions, I think about what is good for other people.	0%	0%	21%	38%	41%
When things do not go how I want, I can change my actions for the better.	6%	3%	16%	39%	35%
I can make my own goals for learning.	0%	3%	13%	29%	55%

I can use time wisely when working on my own.	0%	7%	4%	46%	43%
When I have a lot of homework, I can choose what needs to be done first.	6%	10%	0%	37%	47%
I can work well with all students, even if they are different from me.	0%	7%	10%	52%	31%

Do you know what type of job(s) you will have when you grow up?

Answer	Count n=102 (Post-survey)	Percentage	Count n=32(Post-survey)	Percentage
Yes	71	71%	20	67%
No	9	9%	1	3%
I do not know	20	20%	9	30%

Please select the activities you think you are interested in a career where you would.

Pre -Survey

Answer (n=102)	Yes	No	Maybe
Help to protect the environment	41%	11%	49%
Plan bridges, skyscrapers, and tunnels	8%	65%	27%
Design Cars	16%	52%	32%
Help others improve their physical or mental health	43%	23%	34%
Manage a store or business	35%	27%	37%
Build or maintain houses	20%	47%	33%
Help people or companies find ways to make money	24%	35%	41%
Create art or a performance to share with others	34%	36%	29%
Help to make new medicines	24%	46%	31%
Build or test machines that could help people walk	25%	38%	37%
Take something apart to see how it works	26%	46%	29%
Invent things	35%	38%	26%
Teach others information or a new skill	34%	23%	43%

Design clothes to be worn in outer space	20%	50%	30%
Design smaller computers and cameras and phones	24%	50%	26%
Build Robots	21%	55%	24%
Teach Science	24%	50%	26%
Think of new things and better ways to do things	37%	24%	40%
Figure out how things work	36%	34%	30%
Improve Camera lenses/ TVs/ Computes	22%	52%	26%

Post-Survey

Answer (n=32)	Yes	No	Maybe
Help to protect the environment	37%	20%	43%
Plan bridges, skyscrapers, and tunnels	7%	77%	17%
Design Cars	17%	67%	17%
Help others improve their physical or mental health	22%	28%	50%
Manage a store or business	26%	39%	35%
Build or maintain houses	16%	59%	25%
Help people or companies find ways to make money	30%	43%	27%
Create art or a performance to share with others	35%	35%	29%
Help to make new medicines	17%	43%	40%
Build or test machines that could help people walk	23%	41%	35%
Take something apart to see how it works	32%	46%	21%
Invent things	37%	33%	30%
Teach others information or a new skill	35%	25%	38%
Design clothes to be worn in outer space	17%	60%	23%
Design smaller computers and cameras and phones	23%	60%	17%
Build Robots	20%	67%	13%
Teach Science	13%	50%	37%
Think of new things and better ways to do things	37%	33%	30%
Figure out how things work	27%	53%	20%
Improve Camera lenses/ TVs/ Computes	14%	66%	21%

Participating Teacher Interview Results

Data Summary

The research team conducted interviews with four participating LIFT educators utilizing open-ended semi-structured questions, seeking information pertaining to the following: (1) their Novel Engineering implementations (e.g., how long did the implementation take, how many students participated, what books did they use), (2) their struggles and challenges implementing the projects, (3) how the Novel Engineering projects helped to gauge student interest in, and awareness of, engineering as a future career, (4) the integration of Readable English and Novel engineering projects and (5) their recommendations to improve Project LIFT. This report summarizes the findings into themes. The educator interviews were conducted at the beginning and end of the academic year of 2022- 2023.

Summary of Findings

Books Used to Implement Novel Engineering: To implement Novel Engineering in their classrooms, most LIFT educators used a collection of novels. For example, they used “Wonder”, “Christmas Shoe”, “Island of the Blue Dolphins”, and “Tales of a Fourth Grade Nothing”, among others to implement Novel Engineering.

Amount of Time for Implementation: Most Project LIFT educators reported that they needed approximately four to seven weeks to have students read the novel and complete Novel Engineering activities. To do this, many of the participating teachers split their class hours between reading the novels and working on Novel Engineering projects.

21st Century Skills: We asked Project LIFT educators to share their overall experiences (e.g., success, struggles, challenges) implementing Novel engineering in their classrooms. Most educators expressed that the students in their classrooms enjoyed doing and designing the engineering projects. The educators also mentioned that students engaged in critical thinking, and problem solving while doing their engineering projects.

Reading and Reading Comprehension: Project LIFT educators reported that their students developed fondness towards reading and improved their skills in reading comprehension. For example, one of the teachers expressed the following:

“I think it's great, especially my kids that don't enjoy reading so much. Now they are like, Oh, I'm going to read this... they're

getting more out of it. And the comprehension has been so much better because of Novel engineering.”

Challenges: Project LIFT educators expressed concern that some students wanted to engage more in the social issues (such as bullying) presented in the novels like bullying rather than look for engineering problems to solve. In these cases, the teachers needed to prompt the students and explicitly help them find engineering problems to solve (instead of having the students identify the problems themselves).

Career Connections: We asked Project LIFT educators about how Novel Engineering projects may help student interest in and awareness of engineering as a future career. Project LIFT educators believed that the participating students gained an understanding of engineering as a profession.

Women in Engineering: It is noteworthy that many of the participating educators noticed girls were more interested and engaged in doing Novel Engineering projects. For example, the teachers commented:

“I think they can see that they can be creative and then still create a product. That's really valuable”

“I definitely think it's giving them a tangible thing to say, oh, I can do this, or I could solve a problem and actually make it work in some way. So, I have seen a lot more competence with that.”

“By sharing information and bringing in those extra careers, and especially the engineering one, and showing students that they can definitely do this and it's not out of their reach - it gets the girls more involved.”

Overall Thoughts About Project LIFT: Project LIFT educators were asked to share their advice, questions, concerns, or comments about Project LIFT at their schools. Most educators felt it would be a great help for them if they received more follow-up training on Novel Engineering in the future and felt it would be helpful if they could share their projects with other educators. They expressed that they would feel more confident about the implementation of Novel Engineering projects if they had a community of educators to discuss their implementations. For instance, one of the teachers said:

“I do think I would enjoy a second follow-up workshop, even like you said, just with other people doing Novel Engineering to see how

they're doing it. So, something like that, just getting more ideas, would be super cool.”

Changes from 2021-2022 to the 2022-2023 Academic Years: Project LIFT educators were asked to share their experiences implementing Novel Engineering in the year 2021-22 and how the implementation compared with their implementations during the year 2022-23 school year. All teachers expressed more confidence and comfort in implementing Novel Engineering projects during the second year. They also acknowledged that they were expanding the projects across different grade levels. For instance, teachers said:

“I know, we're definitely going to do it in everybody's class, and probably more than once. So, it's really expanded itself. And we've gotten to go into a much, much more depth than we did last year.”

“This year, we've already done a project and they've loved it. So, I'm very excited. I feel like I could better answer questions after the second [implementation] because I see obvious improvement. Whereas last year, we really didn't get to do anything like that, because we weren't really able to do groups [due to Covid-19 restrictions]. So, I think this year, it's just a lot more smooth.”

Participating Coach Interview Results

Data Summary

The research team conducted interviews with two participating Project LIFT/Readable English Coaches utilizing open-ended semi-structured questions, seeking information pertaining to the following: (1) Their Novel Engineering training & Implementation (e.g., how was the training facilitated by the IU school of education, how did they conduct training with the teachers in the schools, how did the teachers implement Novel Engineering in their schools with their students?); (2) Their successes and challenges implementing the projects, (3) how the Novel Engineering project aided student interest in, and awareness of, engineering as a future career; And (4) their recommendations to improve Project LIFT. This report summarizes the findings into themes. The coach interviews were conducted at the end of the academic year of 2022- 2023.

Summary of Findings

Experience with LIFT Project: Project LIFT coaches were asked to share their experiences about the Novel Engineering training they received from Indiana University School of Education faculty and how they provide training to the teachers in Indiana schools. Overall, the coaches said that the training they received was very “good” and sufficient for them to train other teachers. Since they received all the necessary resources and materials including slides for presenting Novel Engineering to other teachers, they did not find many difficulties conducting Novel Engineering trainings in the schools they were working in. They expressed that it would be more helpful for them if they received more instructions and materials to monitor and assess teacher and student outcomes regarding the Novel Engineering project.

“The Novel Engineering training has been very helpful. I felt like I had most of the knowledge I needed to train teachers. I know (Indiana University School of Education faculty member) came and did some training with me one day with the teachers. There were maybe a few things that he brought up that I didn't think about. I kind of used his PowerPoints to guide my presentations and use that to show teachers.”

Challenges: Project LIFT coaches expressed concern that teachers lack sufficient time to implement Novel Engineering in their schools. According to the coaches, some teachers did not get enough time to implement the engineering projects properly with all the steps of the engineering design process like finding problems,

brainstorming ideas, building, testing, and iteratively improving. Furthermore, the coaches reported that the teachers also found it difficult to find novels in PDF format to work with the Readable English components of Project LIFT.

“I am finding like a lot of my teachers aren't doing it for another week or two, just because, you know, they've been trying to squeeze it in, but with (state) testing, and this and that, and everything, it's just been really hard for them to try to find a place to get that in, so a lot of them said that they will do it during the last couple of weeks of the school year, because that will be something fun for the kids to do.”

“I think the other hard part has been, and I know this is just a Readable English thing in-a-way, but trying to find PDFs of the books that they want to use, so that we can get them converted (to work with the Readable English program). That has been difficult for some books. I still have one that we're still trying to find.”

Overall Thoughts About Project LIFT: Project LIFT coaches were asked to share their advice, questions, concerns, or comments about Project LIFT with their teachers and students at their schools. Most coaches felt it was a “great project” and that the participating teachers and students really enjoyed it. The coaches stated that many of the participating schools want to continue the project next year. They expressed that Project LIFT will be more beneficial if implemented at the very beginning of the academic year and could receive a library of the suggested novels with available PDFs so they can work with the Readable English program.

