SAMSUNG

Solve
for Tomorrow

Mentor's Guide

Solve for tomorrow?

SFT is a STEM-based corporate citizenship program that fosters creative problem-solving skills in students to bring to life ideas that bring positive change to our society.

Each team is comprised of a group of students and a teacher. The projects are completed through a six-to-nine-month period of planning, learning, development through the design thinking process, and mentoring from a Samsung employee.

Over 2 million students and teachers in about 30 countries participated since its inception in 2010. The competition has helped them with problem solving and collaborative skills and piqued student interest in STEM and their communities. What especially SFT values is not only the final product, but equally the growth that students gain through the experience.

Why mentor?

The keys to success at SFT are held by the students, teachers, and mentors.

The students are the main players of the projects, while the teachers provide coaching and guidance to help with the problem-solving process. Mentors are the consultants, providing the expert knowledge and experience that the students and teachers need during the process.

This guide contains five core guidelines to help mentors effectively provide the necessary STEM-based expertise and experience to the students. We hope that this will be a meaningful and memorable experience for everyone, including you as a mentor.

Guideline 1 : design thinking

Understanding

SFT is based on the design thinking framework. The students and teachers progress through the project with the following phases.

- **Empathize**: Understanding and empathizing with the users' problem.
- **Define**: Discovering and defining the users' problem and setting goals.
- **Ideate**: Brainstorming ideas and forming solutions.
- **Prototype**: Actualizing ideas and solutions.
- **Test**: User testing and evaluation.
- (**Iterate**: Continuous improvement through repeated cycling of the above phases.)

The five phases are repeated in an iterative fashion until a satisfactory solution for users is produced. What mentors see of the prototype will be an outcome of the above process. As a mentor, understanding the design thinking process will allow you to properly understand how the students arrived at the solution and provide the right guidance.

Provide technical and practical feedback with the aim of elevating their solution to higher standards. But at the same time, keep in mind that the students' learning and growth through the process is just as valuable as the final solution.

Checking

Questions to inquire about the phases

- **Empathize**: What was the users' core problem that was observed? What change was deemed necessary, and why? How aware do you think the users are of their situation? What makes this project so necessary?
- **Define**: Do you have a problem definition that resonates with the users? Will the resolution of this problem bring about the ideal result?
- **Ideate**: Has there been a decision about a realistic idea? Has the feasibility-impact matrix been suitably utilized?
- **Prototype**: Have the incorporated functions been developed enough to reap meaningful and useful feedback from the users?
- **Test**: Is it working as expected? Does the solution address the original problem that the users faced? What other possibilities does the solution hold?

Provide your perspective as the expert, especially on potential blind spots as well as methods that may lead to a simpler resolution of some of their challenges. Give suitable coaching and information on any technical training that you deem would be necessary.

Guideline 2 :
understanding young students and establishing a learning relationship

Understanding young students

Participating students are generally highly motivated, proactive, and optimistic. However, reviewing the following points can help you better prepare your approach to the mentorship. Keep in mind that these are generalizations and there will, of course, be individual differences.

The students may:
- Be more used to searching for and learning through videos than reading through documents.
- Be more accustomed to finding instant answers from search engines, so they may not be used to other "slower" investigative methods.
- Ask lots of "why" questions because they want to fully believe in the direction before complying and decide for themselves what they want, rather than passively follow along.
- Have been raised in an environment that encourages the expression of the individual rather than the communal through collaboration.

- Have broad but shallow knowledge, so will need support in checking for accuracy of what they know, engaging in deep thought, internalization, and practicing the process of inference.

Establishing a learning relationship

Establishing rapport with the students is important, but keep in mind the intent, which is the establishing of a learning relationship. There is value in being a mentor that is friendly and easy to approach, but learning relationship is what will be more valuable and beneficial for the students' success.

Having a learning relationship means that 1) the focus is on the SFT project processes, 2) you support the students discover answers to relevant questions, and 3) your expertise is able to supplement some of their weaknesses. This will raise the quality of the project and allow you to earn the students' trust. Connecting with the students through the latest trends and interests of young students can be fun. But ultimately, the **focus should be on building trust with the aim of supporting the successful progression and completion of the project.** Make the most of the experience as a mentor as you help the students' grow and arrive at the final solution.

The feedback you provide must be clear and accurate. Softening the feedback for fear of hurting their feelings will cause more challenges. As their mentor, remember that the feedback is not about the students, but the project. The clarity and accuracy of your feedback will add more value to the learning relationship.

Guideline 3 : essential questions

Question purpose and content

1. **Comprehension questions (meta awareness)**
   Probe and inquire to see if the students truly understand the project and ideas. Unclear knowledge and approaches will create many difficulties. If necessary, help them gather and engage with the information they need. And feel free to share any of your own resources that may be relevant and add to their success.

2. **Broadening questions**
   You may observe challenges that stem from a narrow view or settling for what you see are mediocre solutions. Help the students broaden their perspectives and challenging them to explore the possibilities. Encourage them to conceptually see "the other side." For example, if they are dealing with towards, then what does the away look like? If the focus is on the present, what about the after or what would be the impact of a certain environmental change? Broadening questions can be used to widen the students' perspectives and discover new answers.

3. **Deepening questions**
   The students must look beyond the apparent and engage in deep thought with their ideas to produce quality solutions. Ask about the depth of their thinking and whether the fundamental issues behind the problems have been discovered. Help them clarify and visualize their solutions through your questioning. You may choose to use the 5 Whys method to help the students delve and discover.

4. **Guiding questions**
   When possible, ask questions that allow the students to discover the answers for themselves, rather than simply giving them the answers. This approach is especially useful when the answers are within reach of the students. For example,
   "What made you think that way?"
   "What do you think you need next, and how will you apply it?"
   "What efforts have you made to solve the problem, and what do you think would be the best solution?"
   "How can you add value to the project with the new ideas and information you've gained?

Guideline 4 :
facilitator (teacher) x mentor

Roles and responsibilities

The teacher overseas the whole process and manages the students. The teacher managers and facilitates the design thinking process, from the beginning to the end of the SFT competition period. Mentors check the students' ideas and provide the STEM-based expertise and experience.

Both the teachers and mentors share the common goal of student growth and success, but the responsibilities are different. We recommend that you first consult with the teacher if you have new ideas and feedback that you may have outside of the project itself, such as student management or the design thinking process.

Respect

There must be mutual respect between the teacher and mentor. Teachers deserve a lot of respect for the hard work they have put into being with the students and bringing them to this point. There may be things that they lack from an expert's point of view, and things may not progress as quickly as you would like. At times, the quality of the solutions may not meet your standards. But keep in mind that nothing is perfect the first time and be the support that they need.

The teacher may not be an expert in STEM subjects or knowledgeable in the latest technology. But remember that everyone has their areas of expertise, and help the teacher gain more trust and respect from the students.

Two-way communication

As a mentor, you will have experienced a wide range of real-world projects and methods that enable precise and efficient work. Pass on relevant know-hows to the teacher that may benefit the project. When students experience challenges caused by issues such as lack of communication or preparation, alert the teacher right away. Good communication between you and the teacher will be another factor that will bring student growth and success.

Guideline 5 :
general tips for the mentoring process

**Question
purpose and
content**

1. Clearly explain the reason for your mentorship. (Show them that your goal is to help and you are on their side.)
2. Listen first before giving feedback. (Instruct them to allocate some explanation time and to prepare for it.)
3. Start with praise and affirmations. (Give detailed praise throughout and to the end of the project.)
4. Open with questions. (See Guideline 3: Essential questions.)
5. Make it a two-way communication process, not a one-way delivery. (Discuss things one agenda item at a time. Summarize the main points before moving on to the next agenda item.)
6. Help the students better understand by showing examples and utilizing diverse means. (For example, visual resources, storytelling, evidence documents, etc.)
7. Use words and terminology easily understood by the students. (If there are difficult but important terms that the students must know, instruct them to learn them and come prepared.)

Closing

Thank you for participating in the SFT project as a mentor. Your dedication and interest in the students and their project will make this an especially meaningful and memorable experience for them. The students will grow immensely throughout this period, and we hope that this will be a valuable time for you too as a mentor. Please contact us if you require additional resources available on SFT and design thinking.
Thank you, again, and good luck!