

H FOR HUMAN PRACTICES

Created by iGEM Stockholm 2017,
updated by iGEM Stockholm 2021 for
the Nordic iGEM community

With feedback and tips on the Nordic iGEM Conference
(NiC) organisation by iGEM Gothenburg

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What is “Human Practices”?

Human practices is about exploring the bigger impact of your research by taking the project out of the laboratory and applying it into a real-world context, thereby answering the question: “How will your project affect the world, and how will the world affect your project?”

As a team, you will need to consider the safety and environmental sustainability of your project and also take into consideration the ethical aspects of your work. Human practices is divided into two main parts:

- **Integrated Human Practices (HP)**
- **Education.**

Integrated HP refers to the demonstration of how your out-of-the-lab exploration affected and changed your research and design. Education involves engaging the broader society, raising awareness, educating and establishing a dialog with the community.

Human Practices can be a broad and undefined field, however, it is an important part of the project. We, therefore, believe there is a need for a Human Practices manual that guides teams from day one to the Big Jamboree. This edition is made for the Nordic iGEM countries, including a chapter on the organisation of the Nordic iGEM Conference and similar big events, so that everyone can master their Human Practices!

Manual Overview

Who does not know the area better than previous winning and nominated teams for Human Practices and their judges? This manual is built on a questionnaire sent out to previously successful teams, judges and the official judging handbook of iGEM. Additionally, it has been updated with a section on digital events and outreach possibilities.

The manual is divided into two parts, one where the broader themes included in

iGEM are described, and a second part that includes the practical challenges that you may be faced with during the project, including: How to start up your Human Practices, how to structure your team, time management, medal criteria and detailed information about the different areas of HP and good examples to demonstrate it.

How to start

Short answer: "The earlier the better"

Before you have a project idea, start by reading up about HP. Gather information and start thinking about who your relevant stakeholders are - who will be affected by your project?

Go out and speak to the community and integrate their thoughts, experiences and feedback into the project from the beginning. This way, HP will follow you throughout the project.

How do we structure our team?

Short answer: "With clearly structured areas of responsibilities, where the whole team is kept in the loop!"

We suggest these two ways of dividing the workload amongst your team:

1. Either you have a subgroup working on Human Practices, with at least 2 people working full-time (preferably more) and 2-3 working part-time.
2. Include the entire group working on Human Practices with 2 members working full-time.

Most successful teams choose the first option, although it is always important to involve the whole team in your events and integrated work.

How much time to spend?

Short answer: "More than you think!"

To ensure that you reach as successful goals as possible in your Human Practices, we suggest that you spend at least 30% of your total project time

on it, according to the previous successful teams!

Also, keep in mind, iGEM is much more than a research project and continuous work with HP during your time in iGEM is important. The jury loves integration, so make sure to form bridges between all other subteams by forming common projects and helping the subteams by finding collaborators for them.

Look at other successful teams

Short answer: “Good artists copy, great artists steal – Steve Jobs”

We are not encouraging you to steal, but don't reinvent the entire wheel. Instead – learn from previous teams and get inspired by their processes and outcomes.

Go through previous successful teams' wiki-pages. From these pages, you will get inspired, get an idea of how the entire process works and how they managed their team and timeline. Since the first iGEM competition in 2003, there have been loads of teams that accomplished great results. In many of these cases you can also be inspired by, and build further on their work.

Education

Issues regarding certain aspects of HP, such as ethics, sustainability, safety and security don't always have simple solutions. iGEM teams should therefore strive to educate and engage the broader society to find the best possible solution to these issues.

A successful Education project should involve innovative educational tools and public engagement activities that enables, facilitates and catalyzes a discussion regarding the science behind synthetic biology. This will lead to sparks igniting for new scientific curiosity and will lead to an increased established public dialogue about synthetic biology, with and from voices outside the laboratory.

Although, it's important that **Education should NOT be pursuing how great iGEM is or how synthetic biology can save the world. Judges will focus their evaluations on whether a dialogue was established between the team and the public.** Sometimes it is important simply to listen and try to understand, instead of spreading your own knowledge.

According to the Judging Handbook 2021:

The Education prize is evaluated on the following aspects:

- *How well did their work promote mutual learning and/or a dialogue?*
- *Is it documented in a way that others can build upon?*
- *Was it thoughtfully implemented?*
- *Did the team convince you that their activities would enable more people to shape, contribute to, and/or participate in synthetic biology?*

Keep in mind that your Education project may not necessarily have anything directly to do with your “wetlab” work.

Integrated Human Practices

In Integrated HP you consider important questions beyond the lab bench such as ethics, sustainability, social justice, safety, security, environmental impact, or intellectual property rights. As a team, you need to demonstrate that you have investigated, addressed and integrated one or more of these issues into the design of your project (typically the “lab” component or final application)

You should also combine the input and dialog given from your public engagement, and integrate the society's opinion into your research and product design. You see, they go together!

You will be evaluated on how well you show that the results of this research

are fully integrated into the design, execution and presentation of the project.

According to the Judging Handbook 2021:

The Integrated Human Practices prize is evaluated on the following aspects:

- *How well was their Human Practices work integrated throughout the project?*
- *How inspiring an example is it to others?*
- *To what extent is the Human Practices work documented so that others can build upon it?*
- *How thoughtfully was it implemented?*
- *How well did they explain the context, rationale, and prior work?*
- *How well did it incorporate different stakeholder views?*
- *To what extent did they convince you that their Human Practices activities helped create a project that is responsible and good for the world?*

The way of answering the question “How will my project affect the world, and how will the world affect my project?” is to simply **address all the stakeholders** involved in your final product. And preferably do this at an early stage so you have the time to integrate it into your project! And don't forget to execute a proper (theoretical) product development.

Supporting Entrepreneurship

One of the Special Prizes is called “Best Supporting Entrepreneurship” and to make it clear, this is not a part of Human Practices. But if you conduct proper product development in your integrated HP (which you should), you will notice that these two categories go together and you might be competing for another prize!

According to headquarters, it's hard to differentiate them. The main difference is that in the entrepreneurship prize, you target one or very few specific

stakeholders, while in Integrated HP, you target them all.

Would you like to be successful in this? Then you will have to construct a formal business plan based on customer needs and create a viable product that customers want to use. If you have a finance or acquisition team, it might be nice to involve them in the entrepreneurship part of your project.

According to the Judging Handbook 2021:

- *Has the team discovered their first potential customers and identified any unmet needs not yet covered by other existing solutions?*
- *Has the team shown that their solution is possible, scalable, and inventive?*
- *Has the team presented logical product development plans with realistic milestones, timelines, resources, and risks?*
- *Has the team outlined the skills, capabilities, and stakeholders required to be credible in developing their solution further?*
- *Has the team considered the positive and negative long term impacts of their fully developed solution?*

Applications/projects

To get you started and inspired we thought of collecting some of the different applications the previous successful teams have done.

Public Engagement and Education:

- *Create a handbook*
- *Make educational kits for students and teachers*
- *Re-design lab experiments for visually impaired students - Clinics, scholarship programs and events*
- *Create a game or an app*

- *Modules for introducing synthetic biology to high schools*
- *Lab tours for different teams, students & complete outsiders*
- *Create a community lab*
- *A project reveal event (e.g. using Gather town, or in real life)*
- *Use art to interest and engage others*

Integrated Human Practices:

- *Newspaper articles with experts*
- *Analysis of laws and regulations*
- *A legal policy or proposal*
- *Visit the customers/patients/doctors*
- *Talk to the government*
- *Guide to patents*
- *Webinars on synbio related content*

Collaborations

Short answer: "Collaboration is key."

As always in iGEM, collaborate! This applies to HP just as much. A couple of months into your project, look out for teams with similar projects or maybe teams that have strength in areas you don't. If you're creating a legal proposal as an example, talk to teams to see how their laws work in their countries. Or why not work and build upon previous teams' human practices work! One of the criteria is "Is it documented in a way that other teams can build upon?" So: research and see if there is previous work that could lift yours and others projects!

The Nordic iGEM Conference

What is NiC?

The Nordic iGEM Conference, or NiC for short, is a conference annually organized by and for the Nordic iGEM teams (Norway, Denmark, Finland & Sweden). Generally, the conference is hosted by one Nordic iGEM team but more teams can also join in and help with organising the conference. Allowing several teams to help plan the event is a good way to score collaboration points or even the partnership criteria depending on how early you start planning/make contact. In 2021, the organizing teams were iGEM Chalmers-Gothenburg and iGEM Linköping and the event was located in Gothenburg. During the conference a competition will be held where the first prize of the competition is the glory of winning and the honour to host the event the coming year. Next year's hosting team will be Linköping!

The conference takes about 2 to 3 days, where the Nordic iGEM teams who joined the event can present their projects but also listen to invited guest lectures within STEM. Also, the hosting team(s) may offer for instance workshops, where the participating teams can exchange knowledge and ideas, as well as tips and tricks on how to handle iGEM. The competition 2021, as earlier years, was about who had the best project (or who could present it best), although smaller prizes were chosen based on other criteria. The presenting teams can also get feedback on their presentation, both from other teams, which serves as good practice for the final presentation on the Jamboree. During previous years, the competition also included a part about the best poster, which had the same outline as the presentations: teams create a poster about their project which they will get feedback on. However, due to the pandemic a poster was not required by iGEM HQ, thus, not being included in the conference of 2021.

On the first day's evening, after all presentations are done, the hosting team(s) are usually holding a banquet or offering some kind of game night. This event is just for letting participating teams know each other and have fun.

Hosting NiC or an event like NiC?

Hosting such an event can be really fun and giving and depending on how you do it helps the team both in human practices and collaboration or partnership. However, it will also require lots of work from you, time that you might not have due to other activities / requirements in iGEM and how many people there are in the team. Our team (team: Chalmers-Gothenburg) had 8 members, where most were needed for

the wetlab and other activities. Fortunately, we made early contact with other teams and ended up collaborating with Linköping-Sweden in organizing the NiC.

So, the **first** recommendation we would give is to have early contact with other teams and see if collaboration is possible. You would still need to be the hosting team and doing most of the work, but it will reduce the workload and it is also good to get input from a team that will visit you, maybe what they would like to see or do while in your city. This would be recommended to do directly after you have decided if you will host an event or not (this is also something which you need to do!).

The **second** thing you need to do is to decide on a date for the event. Preferably the event should be a couple of months after you decide to host, but also a couple of months before the wiki freeze and Jamboree. This is so that you will have a fair amount of time to plan for the event, but also to reduce the workload during the fall. However, in regards to NiC the date is decided by the winning team from the year, so it is usually held before the summer and all the wetlab work. For other, similar events, late July or early August are good to look up, only do remember to check if it collides with other events or if it would interfere much with your lab work, since you will need as many people as possible to arrange the event.

The **third** would be the planning of the event. At this stage you can make use of the team you are collaborating with. For instance, discuss and/or ask what they would want to do in the city. Maybe they can plan the workshops, maybe another event? Another big tip is to contact an iGEM ambassador or check out what other teams are planning or have done to get ideas. No need to reinvent the wheel! Here is a list of points which are good to think about which we also encountered:

- Due to covid, how should we host the event? IRL, Online or semi-IRL?
 - What is possible, do we have restrictions?
 - If they are from other counties, can the other teams come? Will they be in quarantine after they arrive home? Do they want to come?
 - Do we have a place where we can host for everyone? Should we restrict the amount of people visiting?
 - If it is online, should we record the event? Should we stream it live? Where should we host it online?
 - Semi-online?
 - Should the event be offered Live to the general public? This can be good to mention as Education.
 - If you have it live, then test beforehand how everything works? Stream live for the first time at least 1-2 weeks beforehand. This takes more time than one would expect.
 - Which platform should you use? Youtube, Facebook? Both?
- How to structure the budget? (tips: create an excel for this)
 - 0 budget? Profit, loss? What should we expect/aim for?
 - Should each participating team pay? If a team joins online, do they really need to pay anything for instance?

- o What do we need to buy in? Food, decoration, fika, equipment (like sound devices, recording apparatus etc).
- o Do we require assistance, and should they receive anything? (like judges or guest lectures, help in organising). Maybe pay them or gift cards?
- o All events must be covered: costs during the main event, banquet/sitting and additional events (we welcomed teams to Gothenburg by offering a small grill party).
- o Who buys what? **Keep tabs and receipts**
- o Who drinks what? This is important during the banquet or sitting mostly for yourself and if you don't directly sell drinks but offer them.
- Locations, rooms for hosting if IRL or semi-IRL?
 - o If the event is during the summer many activities and booking systems might be down due to vacations etc. so this should optimally be done beforehand.
 - o If IRL or semi-IRL, then how many can fit in the same room? Room for belongings, room for hosts etc might also be needed.
- Host of the conference
 - o Prepare scripts and test them.
- Guest lectures? Who and should they receive some kind of thank you?
- Workshops – what to include? Prepare discussion points
- Banquet/sitting/game night?
 - o Really depends on how you structure it, but yet again keep tabs, budget.
 - o Food – prepare yourself or buy in? Drinks? Décor?
 - o Planning on games or entertainment.
 - o Hosts for the event.
- Schedule for the two days
 - o Make a as detailed schedule for each helper as possible, assign responsibilities to avoid confusions.
- Welcoming teams to the city?

The **fourth** step would be the actual hosting of the event. If it will be hosted IRL, the teams will arrive in your town: welcome them as much as possible. Maybe host a welcoming barbeque before the first day? Good to remember about the hosting is that many things might go wrong, or not as you intend it to. Still try to follow your schedule as much as possible, it will avoid confusion in the team. Don't be angry at people, avoid confrontations and keep in mind that this is a stressful period for many. Have fun and enjoy the event you planned!

The **fifth** step would be the post-event, where you need to return everything that needs to be returned, thank those who should be thanked, clean what needs to be cleaned, return money to those who used it for the event and then go home and rest. Resting is very important at this point. Take a couple of days off in the team if possible and return with new energy.

Time line

Pre-Event

Should we hold an event?
Do we have time?
Collaborate with other team
Reach out to other teams

When to hold the event?
When does it fit with the lab?
how long after decision?
how long before wiki freeze?

Planning:
- IRL? Semi-online? Online?
- budget
- Locations / rooms booking
- Who are hosts/moderators
- Guest lectures
- Workshops
- Banquet / sitting
- Work Schedule for conference
- Welcoming teams to city?

Event

Welcome teams
Fika/coffee during breaks
Storing of items
Hosts
Lunch
Are the guest lectures there
beforehand
Workshops

Post-Event

Return borrowed stuff
Clean
Who has bought what?
Thank you helpers
Rest

Conclusions Acknowledgement

Thanks to all the teams that helped conduct this handbook

Stockholm 2016

OLS_Canmore 2016

Imperial 2016

Groningen 2016

Bielefeld 2015

William and Mary 2015

UofC_Calgary 2016

Cornell NY 2016

Paris Bettencourt 2016

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