

Education & Teamwork

In this chapter we will focus upon education. We will analyze what teams did to educate the public, but also what the influence of iGEM and the teams was on their own education or personal development.

In our survey we have asked the responders whether their team did develop educational tools. It appears that about half of the teams did develop a tool or did something northwardly to mention with education. Most of the teams developed a tool to explain the basic concepts of synthetic biology. For example, multiple teams made a video or pamphlets. There were also two teams that used LEGO to explain the concepts of BioBricks and one team even used Minecraft to explain their project. The team of Leuven developed a card game about synthetic biology. They have noticed that the knowledge about synthetic biology is very low in Belgium. Traditional education methods were in their opinion often too complicated or boring and that is why they have decided to develop a card game.

We also have asked whether the teams did evaluate their tools and if so, whether they were successful to their purpose. Almost 40% of the teams had not the time or opportunity to do this. The teams that were able to test their tool mostly used their tool in a real live setting. For example, they used the tool to educate school children, used it in outreach events or the tool let the tool be reviewed by experts.

Most of the educational activities were targeting high school students; almost 56% of the responders were engaged in educational activities for high school students. With respectively 48% and 40%, the university students and adults were also popular targets groups. Only 23% of the responders educated elementary school children and 10% of the responders reached a target audience outside one of these groups.

Based on the survey we can conclude that there are many teams that are engaged in educational activities. Some of those teams have developed very interesting tools, that could also be very useful for other iGEM teams. We advise to make those tools more accessible. For example, iGEM could make a page with tools about education. Teams that think that they have developed an interesting tool could then register their tool. Other teams that would like to do some educational activities, but do not have the time to develop extensive tools for this, would have easy access to multiple tools. For example, the aforementioned card game can be used by other teams to educate high school children in their own neighborhood. It would also be interesting if teams could evaluate the tools afterwards. In this way the usefulness of tools can be extensively tested and with the iGEM community we can build on an extensive curriculum to teach the public about synthetic biology. Eventually such an education page can contribute to the increase of the general level of knowledge about synthetic biology or SynBio products. As mentioned before, especially in Europe, synthetic biology or biotechnology in more general, is not widely accepted. More and better education about the subject could change this. In our opinion, iGEM could and should take the lead in this. An education page with interesting education tools would already help a lot.

A very important group that has to be educated are the policy makers. As described in the chapter Competition, in multiple countries the regulation of synthetic biology or biotechnology in general, is not sufficient. We have asked teams whether they have interacted with policy makers about rules and laws with regard to their project and applications. Almost 70% of the teams answered no to this question. Most of the remaining responders described that they had conversations, debates and/or gave advise to policy makers. Two of the responders were even able to get more influence in the decisions of policy makers.

iGEM teams have to educate the public about their project and synthetic biology in general, but the public can also educate or influence iGEM teams. Therefore, we have asked in the survey if to some extent the local community did have an impact on the project. Most of the teams stated that the local community did not influence the project or the influence appeared to be negligible. However, there were also multiple teams that certainly were influenced by the local community. For example, multiple teams stated that their project was about local problems or products. In those cases the local community often gave advises or helped them even with the project.

Beside the local community, teams can also collaborate with other external companies and in this way improve their project. About 40% of the teams stated in the survey that they collaborated with external parties. Multiple of those teams have worked with other iGEM teams and also a few teams mentioned that they worked together with organizations to organize policy & practice related activities, such as workshops or exhibitions. Most teams indicated they would not have been able to get certain results or do specific activities without the help of those external parties. Furthermore a few teams mentioned that they worked together with experts in a specific field to improve their project. For some of the projects this has resulted in significant changes or improvements of their project. For example, one of the team mentioned that they had a lot of data that was manually impossible to manage. An external party eventually helped them to manage the data and this helped them a lot.

The aforementioned examples show the potential benefits of collaborations. However, it also appeared that most of the teams did not collaborate with external parties. We think this is regrettable. Fortunately, iGEM headquarters agreed with us on this point and therefore collaboration between teams has become a hard requirement to win a silver medal since this year.

Finally we have asked the responders on a scale of 1 to 5, where 1 is not at all and 5 is really large, how valuable participation in the iGEM competition was for them.

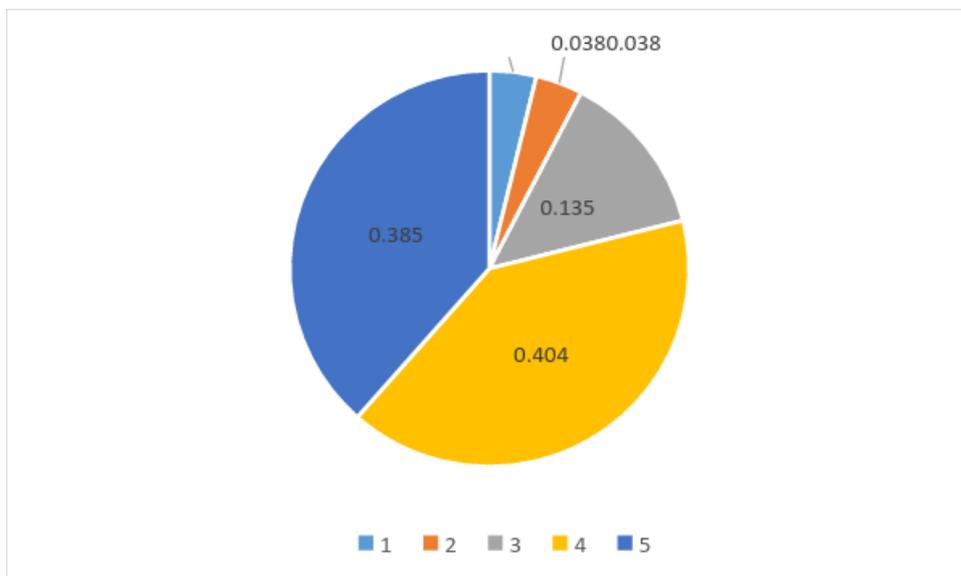


Figure 1. Answer distribution to the question: On a scale of 1 to 5, where 1 is not at all and 5 is really large, how valuable was your participation in the iGEM competition for yourself?

Based on the figure we can conclude that iGEM was very valuable for most participants. For most of the advisors iGEM helped them to improve their instructor skills, to find good students for PhD positions or iGEM helped them with their own research. For most of the students that fill out the survey, the iGEM project helped them to become better researchers and to develop skills outside the lab, such as the communication with external parties and fundraising. A few students also noticed that iGEM let them think about real life problems, develop real products and present their project in the real world. Furthermore, multiple students experienced that working in a team with students from different backgrounds was very educational. They have noticed that the methods and ways of thinking can be very different. Sometimes this can result in frictions, but in most cases it helps to improve you project. Therefore, we believe that it is wise for supervisors to make a team of students from different backgrounds. We have experienced ourselves that this actually contributes to the results of your project. In conclusion, it appears that beside the scientific importance, iGEM also contributes to the development of students and advisors.