REPORT FOR DATABASE ANALYSIS

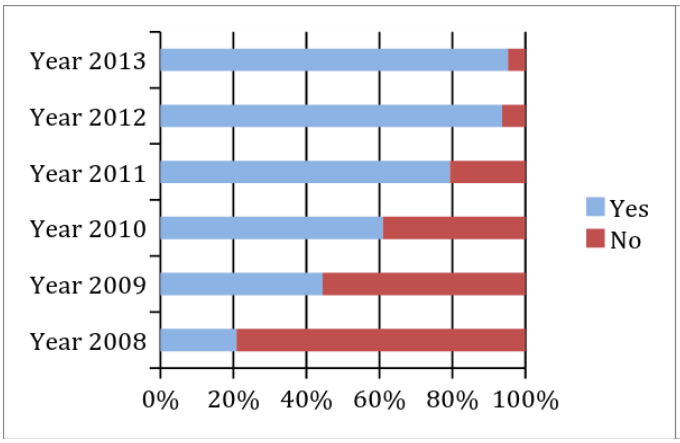
HKUST IGEM 2014 TEAM

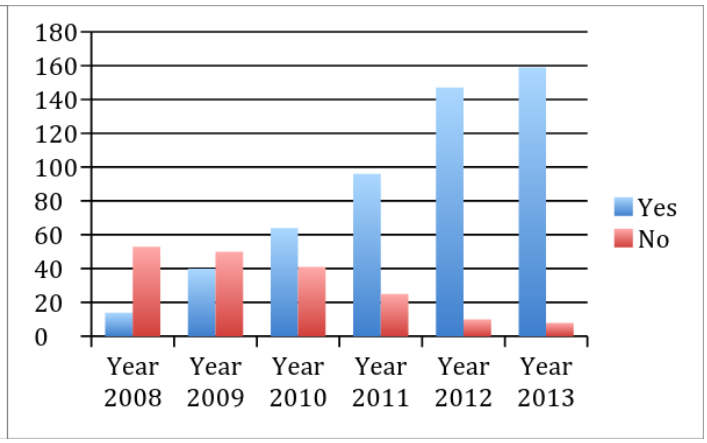
Index

As the iGEM headquarters put effort to bring the topic of synthetic biology close to the society, more and more attention was given to human practice. In year 2008 to 2013, there was a total of 707 teams who joined the iGEM jamboree and received medals, and a total of 1387 human practice projects were conducted. But how well exactly has human practice developed over the years? How much attribution was made in each region? Are some types more commonly done than others? To answer these questions, HKUST iGEM 2014 team gathered all the information since the year 2008, hoping to see some correlation between regions and types of projects done, and some possible trends over the years.

To facilitate better understanding, the analysis is divided into five sections, based on the criteria concerned.

1. Teams who did HP each year





The graph shows the percentage change of teams who did human practice for the period from 2008 to 2013. It can be clearly seen that there has been a large increase in the percentage of iGEM teams who participated in human practice.

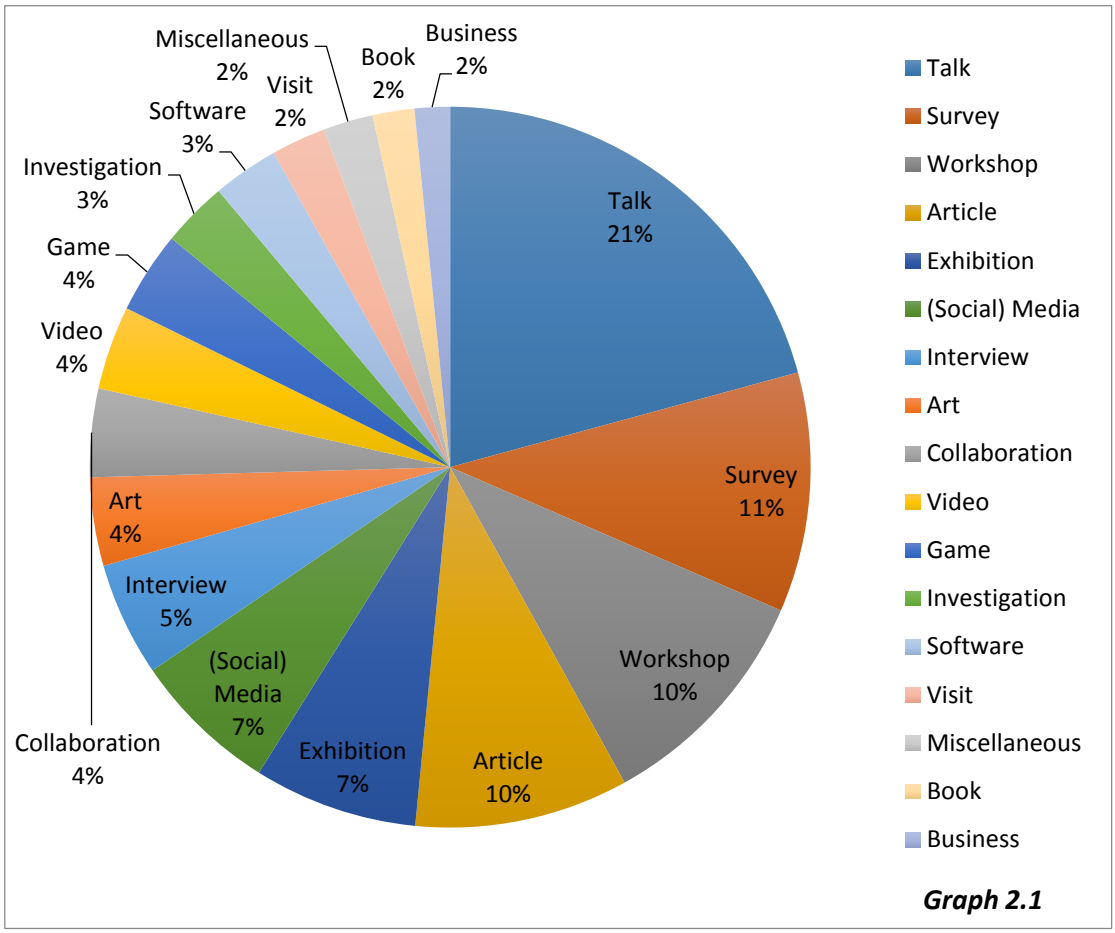
The percentage of teams who did human practice has risen considerably over the time period. In 2008 there were nearly 80 percent of the teams who did not participate in human practice. This percentage decreased to approximately 40 percent in 2010, and then dropped dramatically to 5 percent only after three years. Since 2008 there has been a steady increase in the number of the teams who participated in human practice, with around 20 teams increase annually.

There are multiple reasons for this phenomenon. First of all, it could be caused by the increase of interest towards human practice within the iGEM participants. With the rapid development of synthetic biology, promoting the correct information about this area of science became important. Since the main goal of human practice is to promote synthetic biology and explore different topics towards the work, students are willing to promote synthetic biology in creative ways through human practice.

Secondly, the increasing trend in human practice may have been led by emphasis on human practice by the iGEM headquarters. Human practice is crucial for building safe and sustainable projects that serve the public. The value of human practice has been increasing recognized with the abrupt emergence of issues regarding bioterrorism. Furthermore, being able to communicate is as equally important as doing the lab work. For the reasons mentioned above, the role of human practice grew in iGEM.

To sum up, human practice has become an increasingly popular destination for iGEM teams, especially in recent years.

2. Projects done for each type



Graph 2.1

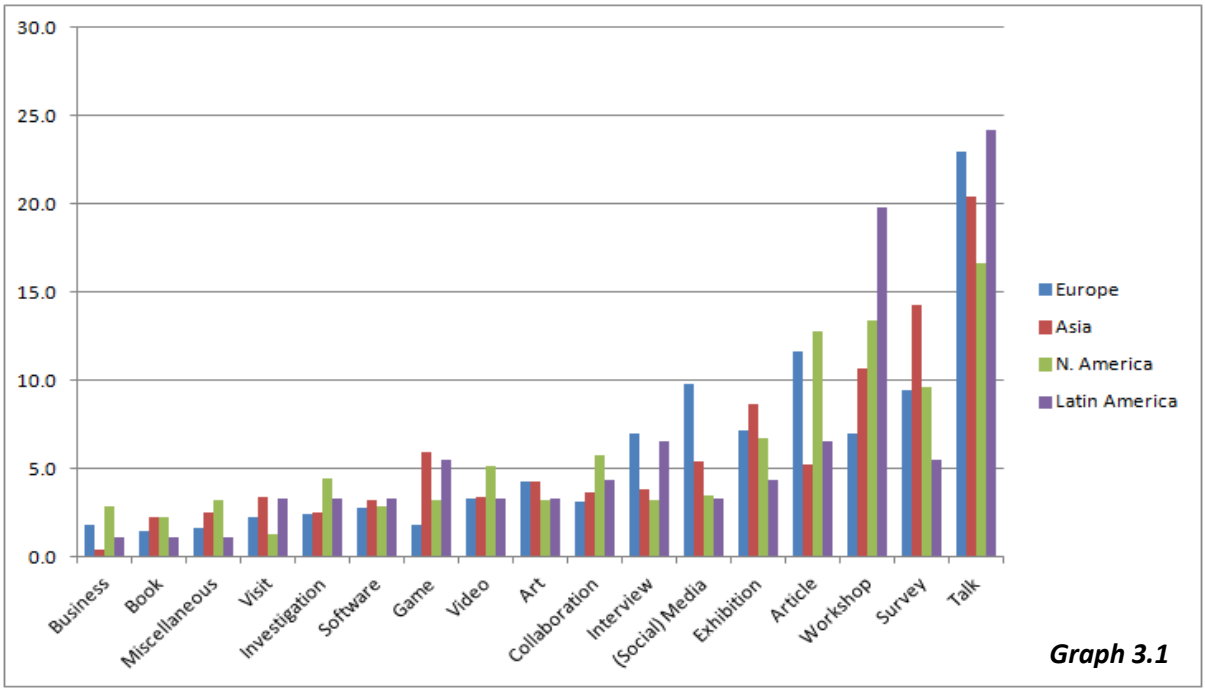
The pie chart above represents the percentage of projects done for each type. While each team has a different way to refer to their projects, all the projects were classified into 17 categories for the sake of this analysis.

Talks seem to be the majority of the types done in the past. 288 talks were delivered from year 2008 to 2013, taking 21% of the entire projects. 11% of the projects were performed in the form of survey, becoming the second largest portion. Workshops and Articles were the third biggest contributors, scoring 145 and 143 times respectively, taking 10% each of the entire projects. Books and Business were the least popular types, only 26 and 22 of them done in the past six years.

Though the results were somewhat expected, the question why talks, surveys and workshops are much more popularly done still needed to be answered. The most likely reason would be that these are the types of projects that involve direct interaction with the public. The sole purpose of human practice is to expose the idea of synthetic biology out to the society, and the three types mentioned

above fulfil the mission in a most obvious way. Teams introduce their projects by holding conferences, observe and analyse people's knowledge and perspective on synthetic biology by conducting surveys, and provide the opportunity for people to witness their working environment and attain hands on experience by giving lab tours and various workshops. Moreover, in order to discuss the current development and future applications of synthetic biology, teams write articles and post it on websites to allow interested groups to gain access and obtain knowledge.

In contrast, types like books and business seems not yet fully developed comparatively. Similar reason can be implied. It seems harder to get in touch with the public by writing and publishing a handbook or children's book, since the number of copies made by each team limits the access. Though constructing a business plan may provide a base ground for future introduction of their product, it makes little contribution to the society in a short term. Nevertheless, all these types should not be discouraged, for they may have dramatic impact in the future.



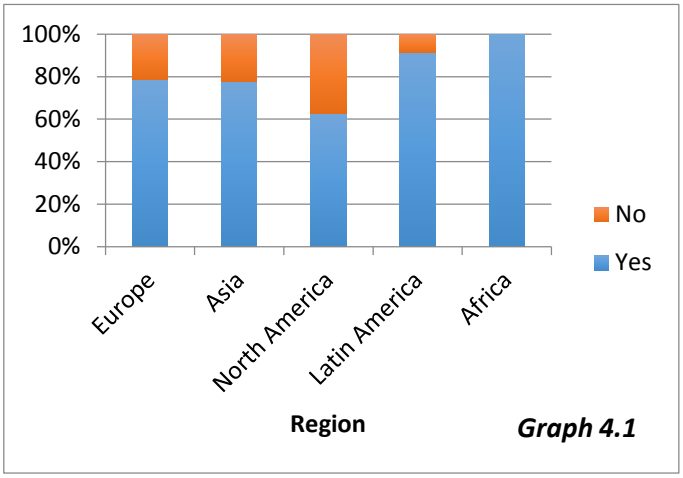
Graph 3.1

3. Projects done for each type in each region

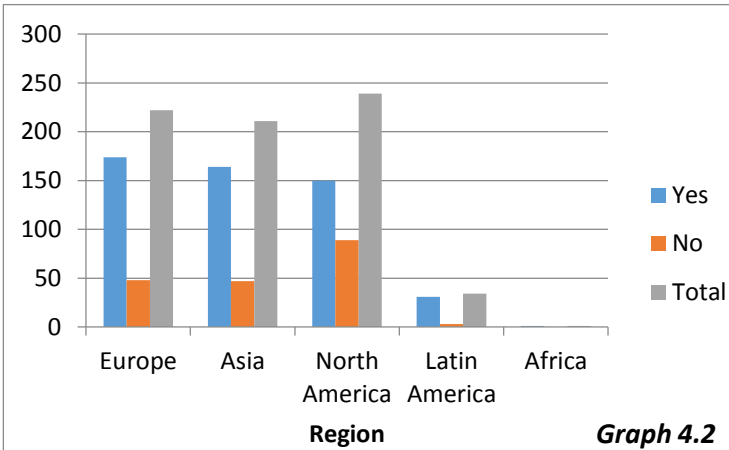
In relation to the types of human practice project to regions, it can be estimated that different regions have different opinions on conducting the types of project. Africa is not part of this graph because they only conducted one human practice project, hence the result will affect the overall view of the graph. The bar graph 3.1 shows the percentage of types of projects done in different regions. The graph stated that most of the teams in each regions shows the highest interest in conducting talks. This statement can be referred back to graph 2.1. It can also be concluded from the graph that Latin America, compared to other regions, have higher interest in holding workshops. Approximately 20% of the team in Latin America did workshop. Europe on the other hand, shows a higher percentage, almost 10% of the projects in Europe, in using social media platforms as a form of Human Practice project. The teams in Asia are more comfortable with conducting survey than the other regions, about 5% more than the other regions. The European and North American teams shows to have higher consideration in writing an article comparatively than Asia and Latin America.

When it comes to other types of projects such as business, books, visit investigation, game, video and art, there cannot be a definite conclusion which can affect the whole point of this section. This is mainly due to the low percentage or amount of these type of projects being made. So to wrap it up, the teams in each regions have their own preference in how to deliver their human practice projects.

4. Teams who did HP in each region



Graph 4.1

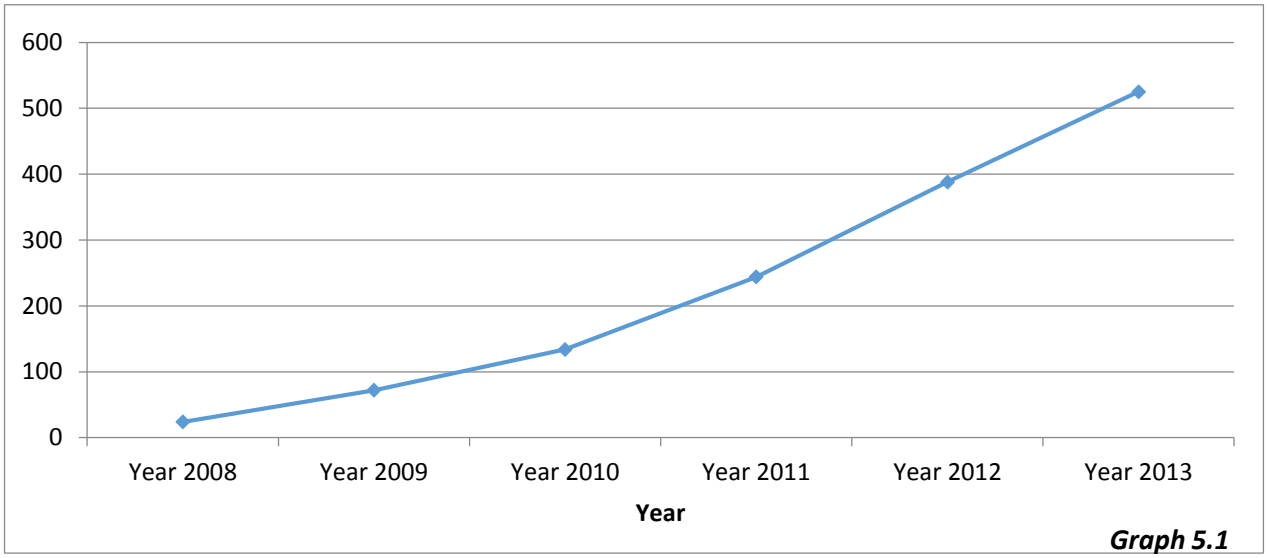


Graph 4.2

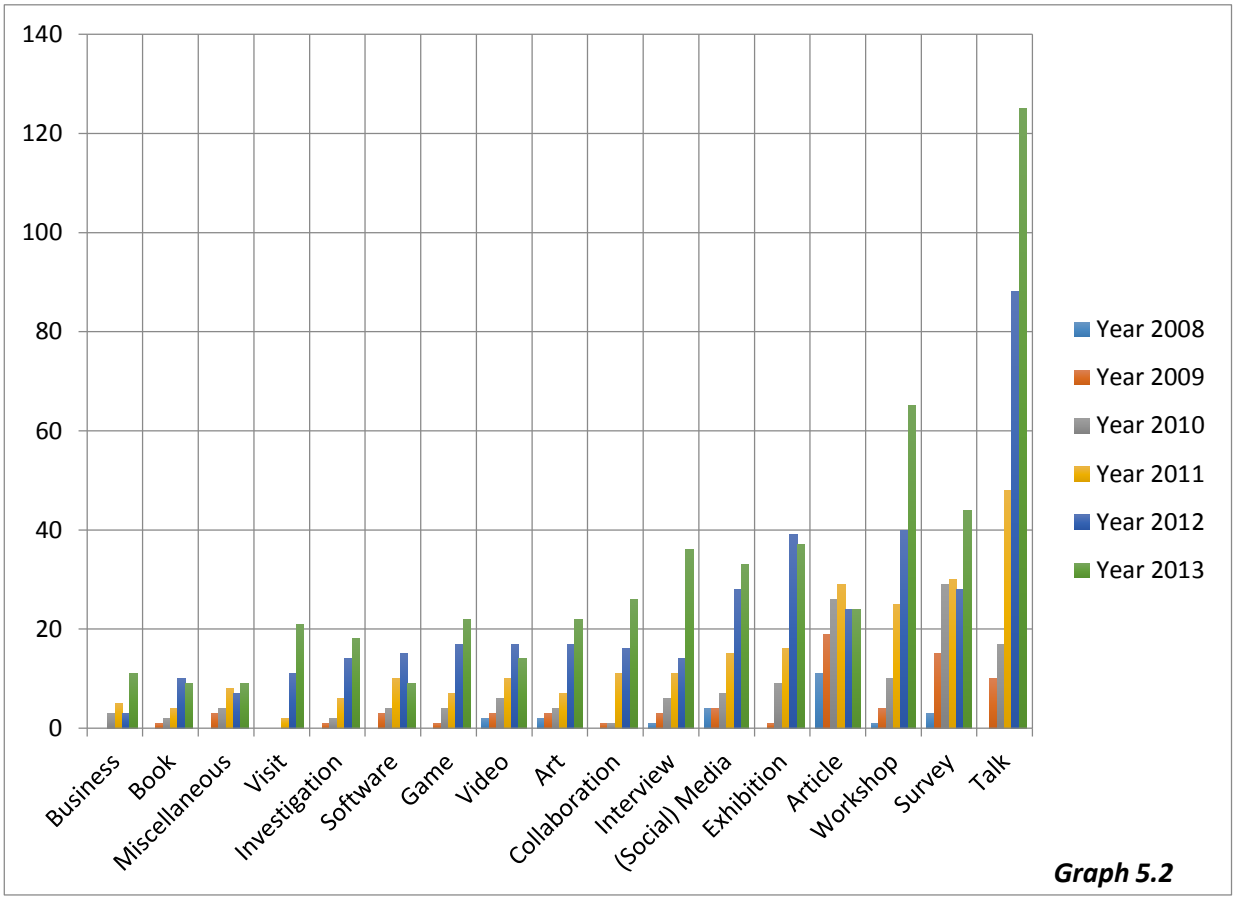
In each region, it can be deduced that the number of teams who did human practice project in each region differ from one another. Graph 4.1 indicates the relationship between the percentage of teams who did human practice project in each region and graph 4.2 indicates the number of teams in each region. Judging by the value indicated in graph 4.1, it can be concluded that all the teams in Africa did human practice project. But in relation to graph 4.2, there exists only 1 team who won a bronze medal or above from Africa. Hence Africa shows a 100% occurrence in graph 4.1, from that 1 team in graph 4.2. The results from graph 4.1 also indicate that approximately 90% of the teams in Latin America did human practice project and roughly 79% of the teams in Europe and Asia. North America scores the lowest among the region with approximately 62% of the teams did human practice project.

The evidence shown from graph 4.2 in relation to graph 1 is quite surprising especially towards North America. Despite the fact that North America has the most number of teams, it seems that compare to the other regions, North America did not show as much attitude towards human practice, in reference to the data in graph 4.1. It can be concluded that from the values of the percentage of number of team who did human practice project in each region is different from one another.

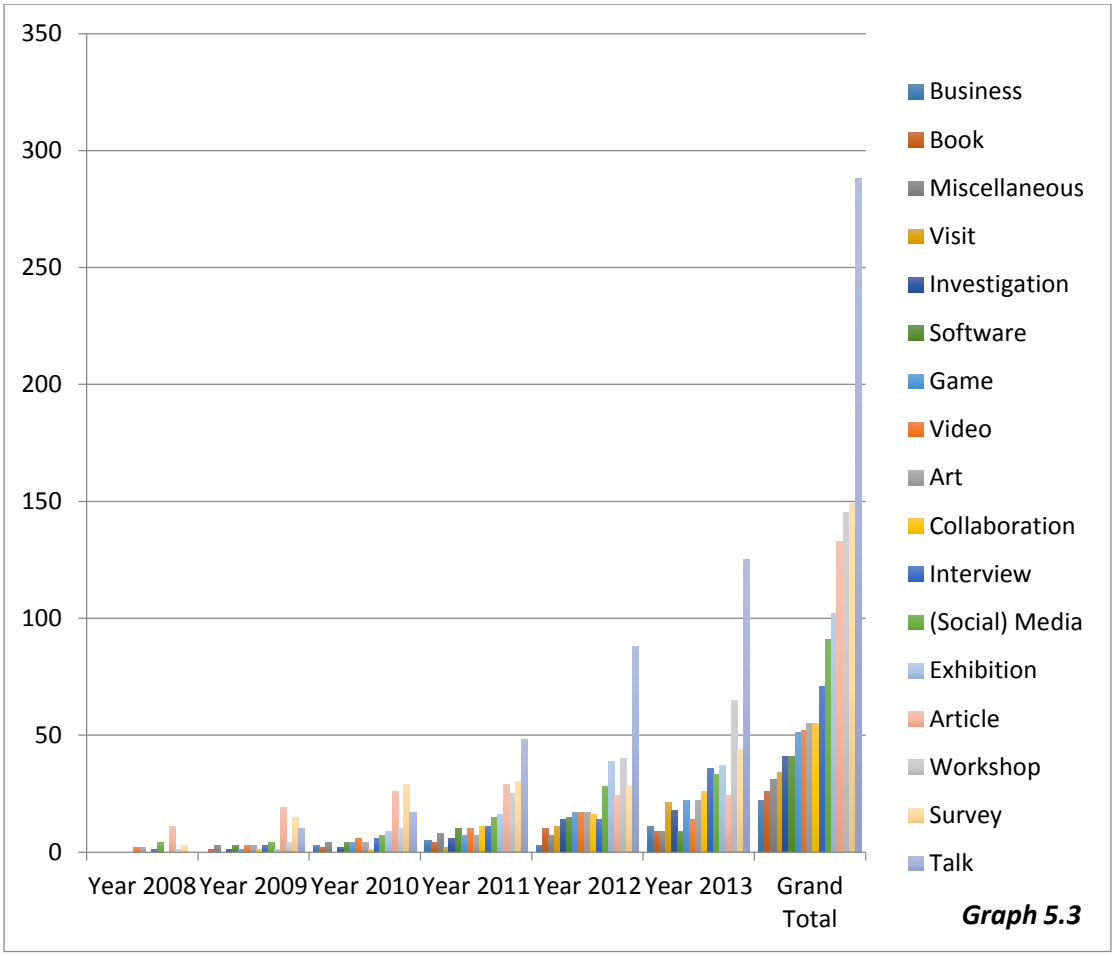
5. Projects done for each type in each year



Graph 5.1



Graph 5.2



Graph 5.3

The number of human practice projects in each type is estimated to be growing in number in the past years. Taking the data from graph 5.1, the amount of human practice project done has increased more than expected. This may be caused by the growing trend of synthetic biology and the increase in the importance of human practice project. Graph 5.2 describes the amount of projects done in each type from the year 2008 to 2013. The observation from the graph can conclude that the amount of projects done in every type increased in every year. Graph 5.3 also shows the number of projects done in each type from 2008 to 2013. From this graph, it is suggested that from 2011 to 2013, talks has been the most favourable types of project. It is estimated that half of the total projects of each types occurred in 2013. This may prove that the number of human practice project is increasing at an acceleration, also as given from graph 5.1. By observing the correlation between the 3 graphs, the turn events of the number of projects done is in 2011 where it increased by almost twice than in 2010.

After reviewing the past human practice projects in a detailed manner, it is safe to say that human practice is becoming a large part of iGEM. Furthermore, the space for improvement and future development was found by looking in to regions and types of projects done.