

COLLABORATIVE PROJECTS – A GLOBAL SURVEY

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ABSTRACT

Collaborative projects between educational institutions and external partners seem to be popular ways to prepare industrial design and design engineering students for professional practice. Such projects are set up all over the world and this paper describes the result of a survey that focus on the practice and experience from 12 such educations covering several continents.

Teachers and study managers have been asked to describe the content and direction of their academic programs and how they organize and structure student's participation in collaborative projects. They also respond to questions regarding the benefits and disadvantages in project cooperation with external partners like companies. The survey shows that in general the industrial design and design engineering programs highly appreciate cooperative projects with external partners and all the programs run such projects during the 4th year of study. Big differences in student group sizes, company size etc. show differences between the educational practice in different institutions.

Keywords: Collaborative projects, industrial Design Program, Design Engineering Program, Design Education, Global Survey.

DOING A SURVEY ON DESIGN PROGRAMS

For several years research conferences have presented and published papers describing very interesting cases [1],[2], on collaborative projects between academic design programs and external partners such as institutions, companies or groups of companies of diverse size. The tendency to establish such partnerships or collaborations seems to grow internationally and each project seems to build on an active entrepreneurial attitude from the involved teachers combined with a deep concern for the student's ability to act in almost professional relations with the real world.

What are the differences and similarities in collaborative projects?

Some universities in this area have many years of experience with these kinds of projects and some of them have even developed generic methods and software protected as intellectual property hence making it possible to support research and further development. Other universities have just started out and are trying out methods and structures that are adjusted to their own specific conditions, interest and resources.

In all cases there are mutual interests among the involved partners in creating valuable knowledge and ideas. The external part might get solutions that are more or less ready for direct implementation and the students learn to work in a realistic context that often simulates the tasks of a professional.

It is impossible to get an overview of all the different approaches and experiences, but would it not be nice to map some of the differences and similarities of collaborative projects done by some of the industrial design and design engineering education programs around the world? This was the intention behind a survey that was set up in December of 2008.

Screening 12 programs in 8 countries

The survey entitled "Collaborative Projects – Problems and Benefits" (CPPB)¹ was set up as an internet-survey using one of the new web-based services available. Teachers and study managers from

¹ A summary of responses can be required from the author of this paper.

13 different universities were invited to take part in the survey and the 12 responses from countries like

China, Canada, Denmark, Finland, Mexico, Germany, Iran and Australia have created a global view on the topic. The initiative was a test in using cheap and easy survey method taking into account that colleagues involved in design and engineering teaching are busy people.

The survey itself had questions regarding quantitative (like *when will the students work in such projects and in what group sizes?*) and qualitative matters (like *what are the problems and benefits in such projects?*). The respondents were asked to give their personal opinion and not the official policy or statement of the university, and the data will therefore also be colored by the respondent's personal attitude and experiences and might not reflect the official attitude at the institution.

Due to the limited number of respondents and questions and the above mentioned conditions, the result of this experiment is, therefore, more like a screening than a deep survey.

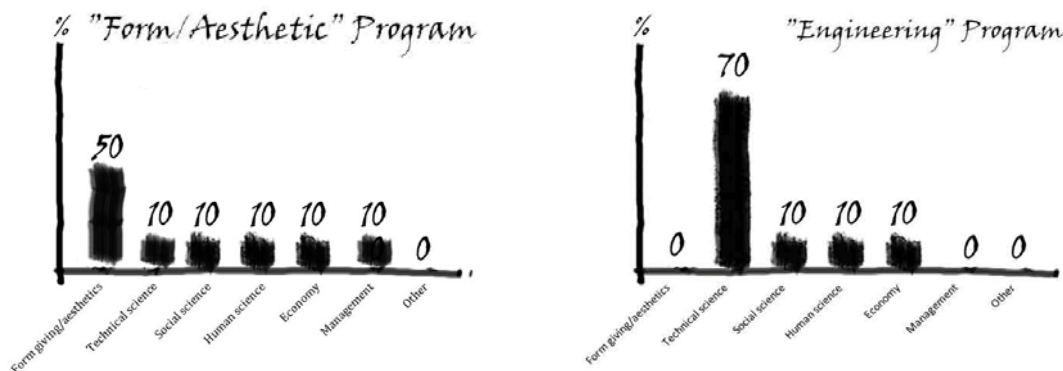
Still, the data from this survey is quite complex and gives more information than you are able to communicate in a single conference paper. For that reason this paper focuses mainly on the quantitative data and gives only a rough abstract on the qualitative data from the survey. The quantitative data tells you primarily when the students work in collaborative projects and with whom. And it also shows to what extent they work in groups.

DESIGN- OR ENGINEERING PROGRAMS

The programs involved in CPPB cover different approaches to design ranging from technically oriented design engineering to more form-giving and aesthetically oriented design. The introduction text in the survey, therefore, also stated that this difference exists and thus the respondents were asked to define the content and direction of their design or engineering program as a mixture of different areas that typically would be found in such programs. Also it was stated that the term 'Design Education' and 'Design Students' would be used in general although some might define their students as engineering students, architectural students or in other categories. Some of the design programs are part of old and internationally well known universities and others are younger, smaller and less known institutions. Some are publically funded and others are mostly privately funded. However, such information is not collected.

Significant variation in content and direction of the programs

In FIGURE 1 you can see the variety in content and direction of the involved institutions. Each institution was to be defined as a percent wise mixture of these areas: Form Giving/Aesthetics, Technical Science, Social Science, Human Science, Economy, Management and Other. Although management or economy could be defined as Social Science they are given their own category in the survey to help the respondents to be more specific in these areas.



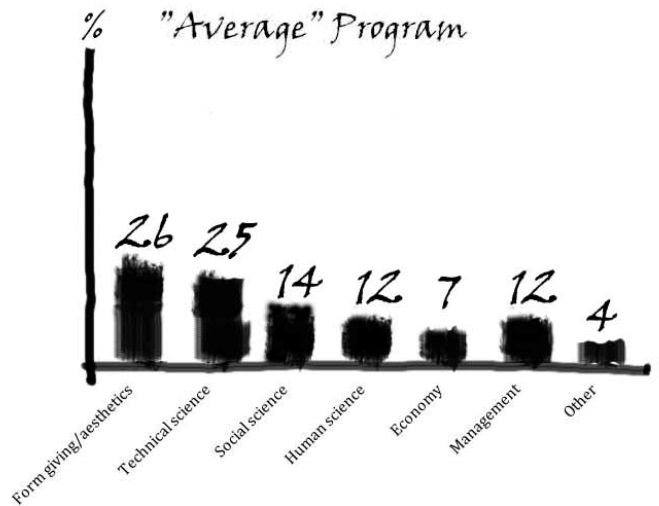


Figure1. Two different institutions and the average distribution of content and aim in percentage

In the three tables in FIGURE 1 you can see the variety in institutions described in the survey. The first institution (respondent10) can be seen as an aesthetic/form giving architectural program and here named as "Form/Aesthetic Program" whereas the second (respondent 9) is an engineering program with strong emphasis on the technical sciences and named "Engineering Program".

The third table shows the average percent wise distribution among the 12 respondents. The tables show that the survey is based upon quite different programs, but also that the average distribution of content and direction of the programs have an almost equal emphasis on primarily Form giving/Aesthetics and Technical Sciences. Although 2/3 of the programs tell that 50% or more is focused on these two categories added combined, it is clear that programs in this area also covers a wide range of more or less related topics. Only two programs focus mostly on either social sciences (30% respondent 6) or management (40% respondent 4).

HOW MUCH EMPHASIS ON COLLABORATIVE PROJECTS?

All the institutions involved in this survey involve collaborative project work with external partners in the syllabus. Still, the students typically take courses and gain knowledge through ordinary studies as well. In FIGURE 2 you can see the percentage of the studies that builds directly upon students doing collaborative projects on different study levels.

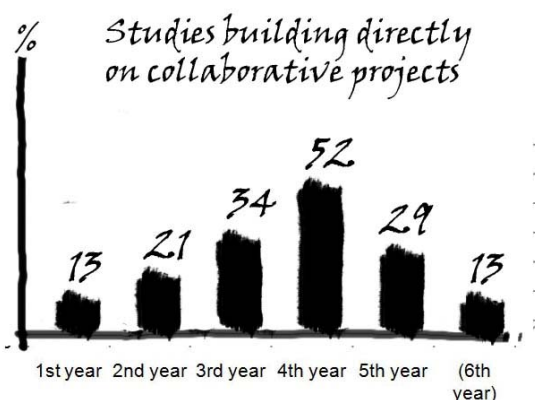


Figure2. The average percentage of studies building directly upon collaborative projects

The table shows the average percentage of collaborative project work on the 12 institutions.

It probably comes to no surprise that the highest percent wise part of the studies have this emphasis in the last years of study. This is the time where the students are able to solve problems to an extent that the external partners find them valuable, and the students might have more time and self confidence for such project work.

4th year = collaboration

An average 52% of the studies build directly upon collaborative projects with external partners during the 4th year of studies. One third of the institutions mentions that 90% or more focus directly on project cooperation in the 4th year and all institutions show a gradually more intense project cooperation from the 1st to 4th year.

In the 5th year, the average percentage falls to 29%. This year is typically the last year of a candidate program, where students often do individual projects. It is not clear whether this is the reason why students tend to do less cooperative projects or the reason is that they do more research-oriented studies in their last year. Still the tradition for doing cooperative projects differs a lot among the respondents. Almost one half of the studies does not focus directly on project work with external partners before the 3rd year of studies, but one institution (respondent 6) claim that 90% of the studies build directly upon such projects from the 1st year and through all the semesters. A 6th study year was mentioned as an option but only 3 institutions offer this.

PUZZLING VARIATION IN STUDENT GROUP SIZES

The institutions in this survey use different educational principles. Some universities use project based learning as a general principle throughout the whole curriculum while other universities only use projects in specific situations. But what is the preferred group size for external project collaboration? If you calculate the average percentage of preferred group sizes used in the 12 different institutions, it looks like the group sizes are equally spread as shown in FIGURE 3.

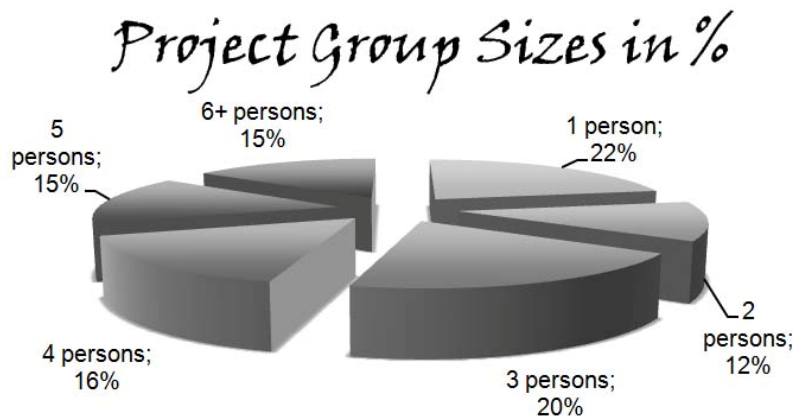


Figure 3. The average student group sizes in collaborative projects

Nevertheless, there are huge differences in the group sizes used in the 12 different programs as shown in TABLE 1.

Respondent number											
1	2	3	4	5	6	7	8	9	10	11	12
4 & 5	1	6+	4	1	3	1	3	1 & 6+	1	5	2 & 3
Preferred group sizes (students in group)											

TABLE 1. The different respondents favourite student group sizes in collaborative projects

Therefore the most significant pattern is the difference in group sizes, and this variation seems to have no relation to national conditions or whether the program is primarily aesthetically or technically

oriented. Respondent 3 only organize the students in groups of 6+ (100%) while respondent 2 and 10 primarily do collaborative projects as individual projects with only one person per project (both 60%). Respondent 6 uses primarily 3 person groups (90%) while respondent 11 has a clear preference for 5 person group projects (70%). The survey does not reveal whether there are individual tasks related to the project groups, and there seems to be no specific professional reasons justifying the huge group size variation. This matter seems puzzling and it could call for a further investigation in a more thorough survey.

THE EXTERNAL PARTNER

Each of the respondents were asked to specify the external partners in the 6 categories underneath.

The figures to the right are the average percentage when looking at all 12 respondents:

A. Large <i>producing</i> company (>1000 employees)	22%
B. Medium <i>producing</i> companies (100-999 employees)	25%
C. Small <i>producing</i> companies (1-99 employees)	29%
D. Studio/consulting business	12%
E. Public organization/institution	12%
F. Other	0%

Although the projects in general mostly involve medium or small size producing companies, the detailed picture shows big differences between the institutions and countries.

The size of partner and the business structure

It may not come as a surprise that the Chinese program primarily works with large producing companies (80%) with more than 1000 employees. The Canadian and the German universities have the same priority (both 60%), whereas the Danish design programs primarily cooperate with either medium or small producing companies. Such priorities seem to mirror the business structure and sizes of these countries as you will find few large producing companies in Denmark, where small and medium size industry is dominant.

Only one respondent stated that most of their cooperation projects (40%) involved cooperation with a studio/consulting businesses and all respondents said that 20% or less of their projects involved cooperation with a public organization or institution. The general picture is, therefore, that most design programs make collaborative projects with producing companies of different size.

QUALITATIVE ASPECTS

The respondents were asked whether they had to adjust their studies on different issues like time schedule, project focus, project format etc. when they did such cooperative projects. They were also asked if they found that the external part had to adjust to the demands of the university according to the same topics. In general, both parties had to adjust to conditions given by the counterpart. Typically, the external part would have to respect the time schedule given by the university and the university had to adjust the program with regard to things like confidentiality and available information.

The qualitative aspects are difficult to analyze or present in a short form, and the data collected on the qualitative aspects shows less variety than mentioned in relation to for instance group sizes. es.

Advantages galore

When asked about advantages and disadvantages in collaborative projects, it was clear that most universities found such initiatives to be either an advantage or a huge advantage when it came to matters such as:

- Developing methods in general
- Developing tools in general
- Gaining knowledge in general
- Developing communication tools
- Developing cooperation skills
- Understanding the profession
- Understanding business and the market

Understanding economical aspects
...and worth noticing:
Creating a better study environment

Minor problems and big ones

On the other hand, the respondents mostly stated, that such projects would create minor problems in the following areas:

Cooperation in general
Agreements/contracts in general
Time frame
Intellectual rights
Exchange of knowledge in projects
Confidentiality agreement for participants
Making the results known to the public
Examination of students

In the category “Big Problems” some respondents mentioned areas like:

Agreements/contracts in general
Confidentiality agreements for participants
Making the results known to the public

CONCLUSION

In the beginning of this paper it was stated that this survey was mostly to be seen as a screening and not as a thorough survey. Only 12 respondents took part in the survey and the different nuances of programs and projects can be hard to describe in a few short answers or categories. The above-mentioned data still shows some significance in certain areas. Especially the qualitative part gives the impression that collaborative projects with external partners are widely seen as a possibility to improve many areas of importance for the industrial design and design engineering programs. However, there are difficult matters to handle when getting involved in such projects as well. The grey zone between the program and the professional tasks are challenged by such projects and so are the possibility to publish results or to ensure an open study environment, where knowledge and results flow freely and inspiring between colleagues and fellow students. This survey only focused upon the opinion of the teachers and study managers. Still it is obvious that also the external partners must have an opinion regarding the advantages, problems and results from working directly with design universities and design students. It would therefore be interesting to see a more thorough investigation that cover both parts and exposes what is being constantly tried out in new variations in the attempt to find ever more rewarding results for all involved parts.

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