Involvement in the design student approach

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Abstract

This paper is about the methodology used in the first six months of the Design course at my university in Brazil. This was inspired by the so called Social Design methodology developed in another Design course where I previously worked as a lecture and researcher.

Educating designers is a complex subject because it is a matter which integrates techniques to help the students to develop their observational skills, creativity, social awareness and individual talents.

A student who arrives at the university has already skills, knowledge, and the capacity to project their life according to his/her education. Including this fact in the class's approach is the first step of this methodology.

The students are told to look for a group outside the university with an interlocutor, where they will develop a real design project. The purpose here is to guide the student, not to propose a problem or even resolve it, but he or she will be able to develop the capacity to identify fertile areas for action. Thus a constructive atmosphere will develop with the aim of bringing new benefit for the group, rather than the more negative mindset concerned with fixing a perceived problem. The student designs an object and tests it in order to get feedback from his adopted group. The student is encouraged to get as much feedback as possible in order to challenge his preconceived ideas and promote double-loop learning.

This paper shows the techniques used by the students related to data collection as an attempt to generate a "model 2" operating system as advocated by Schön and Argyris (Smith, 2001), and some of the projects developed during 10 years of the university design course.

Keywords

participatory approaches, design methods, design and society

Since 1997 I have worked at the Univeridade Federal do Espírito Santo - Ufes, in Brazil, with the students who are starting their first term, or semester. During the first four months the students develop a design project, construct and test it. This is a complex subject because it is a matter which integrates techniques to help the students to develop their observational skills, creativity, social awareness and individual talents. The objective is to give the student an experience of how designers act in a project, to what should attention be paid, how the data can be collected, and in which areas a designer can be useful. This shows the student part of the world he or she will be involved in for, at least, their next 4 years.

This paper will show the methodology used during 10 years of activity using examples of the projects developed by students over these years individually or in groups of 2 or 3 students.

The approach

The student arriving at university for the first time already has a skill set, and knowledge from their experience thus far. We recognize this, and it is the starting point of our methodology.

Here we believe education can enhance the existing capacity of students to allow them to become more aware of how an individual's personal experiences are connected to larger societal circumstances, according to the approach of Paulo Freire, the well known Brazilian educator (Nogueira & Freire, 1966).

The first step for the students is to find a group with whom they will develop a real design project. This group can be a school, a company or any organisation, but it must be outside the university system, and there must be an interlocutor to provide a link between the student and the group. People share and integrate knowledge best in social environments (Nonaka and Takeuchi, 1995) and a good interlocutor is essential for the project. As recommended by C. Alexander (1975), the involvement of the users, the interlocutor, and the student all together will be necessary for a successful experience.

The lack of a formal previous study in this area is substituted for by intuition, involvement with this group (at least 2 times a week) and curiosity. The real life situation instigates in the student the development of his/her capacity to look at the surrounding world when taking decisions. The format is to go to a place with plenty of activity in which the subject is new for the student, because previous knowledge could interfere in their observations.

The interlocutor is a person who is already involved in a project, in a work, in some movement towards getting a result. It is never a person who is waiting for something to happen, or somebody who has a complaint, but is not doing anything to resolve the situation. Engagement with an action is the basic requirement for the profile of the interlocutor. We used to say that the student has to find a person who has "shining eyes". Shining eyes produced by enthusiasm and engagement. The reason is that we believe that it is important that the student, at this initial point, learns to identify fertile fields within a project, identify situations that work and people that will be working WITH them and not people that the student will be working FOR (Pacheco,1996:23).

The steps for the student making the project are:

1) Find a locale with an interlocutor, collect the data, and visit the place at least twice a week over the four months period of the project.

2) Define the general objective of the project

3) Research the subject

4) Elaborate the hypotheses, classify them in groups and test them.

5) Define the specific objective of the project

6) Generate alternatives and test them

7) Define the final alternative

8) Construct it

9) Experiment it

10) Form a conclusion

To find the locale is a very important step, because without a good environment it is very difficult to work well. It is preferable to delay finding a suitable locale and find it, than to work in the first place found just to start the project early. There is an example of a student who was part of a group of the university that started to work in a locale where people were involved in a campaign "if you drink, do not drive". This student was not satisfied with the locale because she could not identify the objective of the interlocutor's actions, since these actions were not very clear to her. Instead of insisting more and trying to identify his objectives later, she resolved to change to another place and there, unfortunately, the interlocutor did not have "shining eyes". This was a physical education class and it seems that the teacher (the interlocutor) was doing a work almost mechanically and her eyes were not "shining" because of this. Then she changed again to another place where the interlocutor had "shining eyes". However, the student could see, in time, that this was because the interlocutor saw in the student somebody to work for him. His eyes were shining not because he was involved and happy with his job, but because he had seen in the student somebody who would follow his orders. By this point the student had concrete experiences of this abstract condition: "to find shining eyes". She had a conception about what this was and she was following her intuition. The result so far was that she had had a number of unpleasant places to work. Despite this, she did not give up and later she found a very interesting interlocutor, a teacher who worked in the interval between formal classes, called "recreação" (this word comes from a two word junction: recreate and action). This interlocutor was somebody very creative and involved with her work, she had a clear objective and accepted the design student to her classes in order to develop a project. It was not easy for the student to find a nice place, but the guidance she received and her own understanding, and fidelity with her understanding, were responsible for the success of this first step of the project.

Once the locale and the interlocutor are found, data must be collected. Beyond natural observation, and records made with pictures and/or drawings, some other techniques are used.

Techniques related to data collection

There are basically 3 techniques used by the students to collect data about the interlocutor and his or her work. The point here is to collect valid data, which is connected to the real world, not to the student's preconceived ideas. So, the strategy is to encourage feedback and outside input. This is an attempt to generate a "model 2" operating system as advocated by Schön and Argyris (Smith, 2001). In other words, to encourage open communication and minimize the influence of predetermined mindsets from either the student or the interlocutor.

The first is called "Listing beliefs and actions". Along side observations of what is happening in the locale, the student starts to make a list of what the interlocutor says about his or her work and what the student can see about his or her actions, comparing one to the other. At one level this is important because, as Bregman and Haythornthwaite (2001) point out, conversations are ephemeral. However, more importantly, this is an attempt to determine the position of the interlocutor. It is common for people to have a mental map on how to deal with situations (Argyris and Schon 1974). However, frequently people's perception of how they deal with situations is different to how they act in reality - espoused theory and theory in use (Smith, 2001).

Making this list is a useful tool for determining the position of the interlocutor at the start of the project.

Example of a classroom teacher as interlocutor is shown in table 1.

Table 1: List of beliefs and actions

Beliefs	Actions
I am very organized.	The interlocutor uses a class plan in which the periods of activities are distinct and she follows what is written in the order it was written.
It is important to stimulate creativity.	The interlocutor holds the hands of the students and shows how to paint a picture.
I prepare each class the night before.	--------------------------
	(The cell above is blank because this action was not seen by the student.)

What this example shows is that the first statement was observed by the student, and the interlocutor's action was related to the statement. Reading the report, anybody would agree with the statement that the teacher is organized.

On the other hand, the action related to the other statement is not an action which illustrates the stimulus of creativity. The result is that the action is not related to what the interlocutor said about her work.

The third statement has an action which happens at a time to which the student has not access and because of this, cannot be considered in the final analysis.

This technique is very important to 2 goals. The first one is to be conscious of to what extent the interlocutor is aware of his/her actions, to be able to select a subject to work with which would be possible in the local universe. The second is to identify which subjects would be under the student's observation. What is done in another locale, or another time, can be interesting, but without the direct observation of the student, cannot be used in this context.

The second technique is another list. A "List of good things at the locale". This list is about everything good that had drawn the attention of the student, about the work being done and the environment around. It is important here to select only examples that are effective. Students always seem to have the habit of observing what is going wrong in a place. They arrive at the locale with the idea that they will resolve a problem and consequently the problem has to be found. The exercise here is different. We stimulate the students to, first of all, pay attention in everything that shows that actions have worked.

Example from a project made with a teacher of Capoeira *(an Afro-Brazilian art form that combines elements of martial arts, music and dance):*

. teacher uses discipline successfully.

. joy in the faces of everybody.

. practice using repetition.

. students respect the teacher.

. students smile when face difficulties.

. abundance of wishes to learn and to teach.

Example from a project made with a teacher who works in the interval between formal classes, called "recreação"

. the teacher explores creativity modifying the use of traditional tools to other functions.

. the teacher talks to the students to reflect about what they are doing.

. the children have a lot of fun in the class.

. the students are stimulated to socialise.

Here we diverge from the intervention strategy of Schön and Argyris (Smith, 2001). Instead of aiming to identify problems in communication within the organistion and intervene to correct them (Argyris and Schon 1978), the case here is to teach students who will in the future have a positive approach to helping the client with design. Thus, we argue that in this context it is more important to identify when and how something goes right, or in other words, produces what is being expected, than to look for negatives.

This list gives the student a lot of inspiration when he or she develops their project because both the list and the final product of this design exercise are linked to the success of the project. We used to say that we work with joy, not with problems. With movement, not with stagnation. We also used to say that we work with what is in abundance, not what is missing. In all of the examples above, the resulting products were linked in some way to each environment as will be seen at the end of this paper.

It is at this point that we differ from traditional approaches in design, because at the same time as the word "problem" means opportunity, it also carries a meaning linked to stagnation and missed opportunity. On the other hand, the word "joy" is suggestive of something going well, movement being made.

So, the "fertile field" can be identified by the student and there is the "gold". There is the solution. The student is stimulated to start seeing the solution, not the problem.

In any given moment a "problem" will not be sought. Instead, only opportunities will be considered according to the behaviour and actions of the interlocutor. The idea is: if the interlocutor is already involved in some project, action, or objective with enthusiasm, and the student works with him or her, this situation will not be called a "problem". It will be called a "project situation".

Still with the aim of developing a model 2 situation, with a maximum amount of feedback, the third technique is the "Word game". This is a visual conversation between the student and the interlocutor. It also derives from another list. In this case, a list of key words related to the universe of that locale. There is no limit to the number of words, but it has to be done after a period observing the place to be as complete as possible. Ideally, someone who knows the locale should be able to say where, when and with whom the student is working by only looking at the list. Verbs and nouns can be used.

After this list is made, the student prepares each word individually on a separate piece of paper, each piece having the same size and typeface in order not to produce any impression of hierarchy. This collection of papers is then given to the interlocutor and he or she is asked to organise them according to his or her own criteria. The interlocutor can take out words that he or she does not believe make sense, or put new words that he or she believes are missing, in order to organise according to his or her logic.

What is the point here? The students, when organizing the list, are making visible what they have in their minds/thoughts. When the interlocutor organizes the words, he or she makes visible what is in his or her mind/ thoughts. So, this visual conversation is

used to clarify a lot about the place, the work that is being done and the characteristics of these two people, the student and the interlocutor.

These examples show different kinds of organization. Sometimes the interlocutor organizes by order of importance, by groups, writes a story or uses different approaches (figure 1).

Figure 1: An interlocutor organizing the word game.

The definition of the objectives

These techniques help the student to analyse the situation, the communication codes, daily life, routine, and in general how the things happen, in order to have material to identify the objective of the project. So, the general objective of the project is only defined after about three weeks of observation. It is never decided on before this because it would be a result of conjectures not certified by the student's observations. A conclusion is only reached after a study, after an analysis, after a period of familiarity between the student and the locale and interlocutor, in order to allow him or her to make conscious choices. This objective is then defined by the students, in conjunction with their interlocutor. The objective is not given to the students as a task to be done.

The students have to put all the data to be analysed together, because they are connected. It is then easy to choose a pertinent objective when this objective is related to a lot of actions of the interlocutor, it is clear in his or her mind and so it can be seen by the student. When analysing it is important to consider the context in order to interpret well the data. Sometimes the objective is not very clear. The list of actions, for instance, is not linked to the word game and this can be result of either a poor level of observation or to an unclear situation. Normally the unclear situation happens when for some reason the real objective of an action cannot be said. For instance, in a fitness academy when the reason for some action is to get money, instead of producing healthy clients. It was common over these 10 years to see students changing the locale because, at this point of collecting data, it appears not to be a good place. It is very possible to make a mistake and what happens is that the group of students has to start a new project in another place. The good part of this is that they carry with them the learning of this experience and this new place is better chosen and the data collection is faster.

The first hypotheses

With the general objective defined, hypotheses are formed and here the student can formulate strange or impossible ideas. All that is required is that all of them must be linked, clearly, to the general objective. We believe that it is important that the student must be free of self-reprimand (a model one value in the Schön and Argyris schema -

Smith, 2001) in order to be creative. Normally the students have difficulty in doing this because they want to be "reasonable". Because of this, it is stipulated that they have to form and draw 20 hypotheses. This number has to be large enough to allow interesting ideas to appear (figure 2).
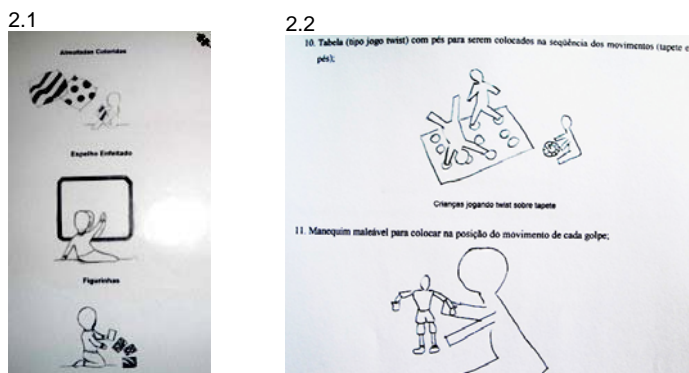
2.1

2.2

Figure 2: Examples of the first hypotheses 2.1) In a project developed with people with visual deficiency. 2.2) In a project in a class of Capoeira.

The tests

From these 20 hypotheses, the students separate the similar ideas into groups and test these groups with the real users. This test is done in order to see if the group is valid, so only a basic mock up is used.

The results of these tests will allow the student to chose the best way forward. The student and the interlocutor will analyse the results together.

In the case of the Capoeira class, the possible objectives defined were to work with either the teaching of the movements of the "dance", the names of the movements or the music and rhythm of the dance. Three possible approaches were tested with the capoeira group based in the three situations: in the first one, the children were stopped in a place and learning, in the second, they were making movements, and in the third working specifically with rhythm.

In the first one, the students should link the name and the movement as playing cards (figure 3). The result was not satisfactory because the drawings of the movements were sometimes confused.

Figure 3: The student tries to associate the name of the movement in Capoeira with the drawing of it.

In the second one a cube/die was used. The child had to throw the cube/die and the face would show the movement to be done. Whoever knew how to do the movement presented himself and did it. This was ok, but the children were more showing what they knew rather than learning something new, and the interlocutor thought that this was outside of his present objective.

The third one was a test to help the children to drum correctly through visual hand guides on the table. This test was very well accepted by the children, and the interlocutor had identified it as the best one (figure 4).

Figure 4: The interlocutor (standing) and the children in Capoeira class.

In the case of students who worked in a school for people with visual deficiency, there was another set of circumstances. The challenge was to stimulate children to identify contrasts and some experiments were done with contrast gloves, a contrast rug and a contrast cube/die.

It was observed that the cube/die and the rug were efficient and then a rug was constructed that could be transformed into a cube/die according to the interlocutor's exercise proposal.

Figure 5. 5.1: Tests with the glove. 5.2: The rug and 5.3: the cube with the interlocutor holding the child in front of the mirror.

Defining the specific objective and generating alternatives

Once the specific objective is known, it is time for the students to generate alternatives, now with their "feet on the ground", considering viability, price, material and dimensions of everything they are thinking of.

At this point, practical tests are again necessary because the next step defines the final alternative to be actually constructed and they need to know which one is the best. In

all of these moments, the interlocutor is participating of the decisions and if other people are involved, they are also aware of what is happening.

The following images show the alternative tests and studies used in the Capoeira example above, until the final product was decided, including a bag to carry the "hands". A design product made by this methodology should include the context. In this case, a complete product should have the tools to guide the children to drum (the "hands") and a place to keep and carry these.

Tests included "hands" with numbers (figure 6.1) and later a study of possible combinations of numbers and colors. Faced with the construction, the students realized that the "hand" should be easier to cut in wood and the form of the hand was simplified (figure 6.2). After tests of the alternatives, it was resolved to use the system of colors and numbers seen in figure 6.3. It was also seen that it was necessary for a bag to be constructed to keep the material together (figure 6.4).

6.1

6.2
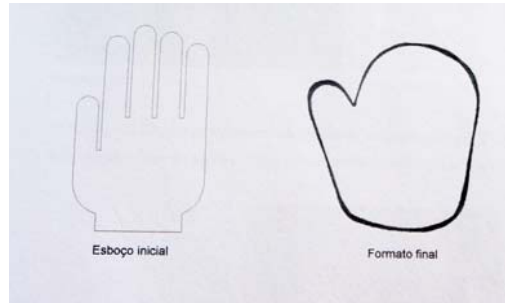
6.3

6.4

Figure 6: Tests and studies made until the definition of the final form of the product in Capoeira class.

In the case of a circus school, the issue was to rank the students according to their skills in order to stimulate them to learn what they didn't yet know, or improve what they needed to.

The idea tested was to put on the wall 2 types of display. One showing, individually which type of performance each student knew (figure 7), and another showing each type of performance, with which students knew them, in order. The best student in the first place (figure 8).
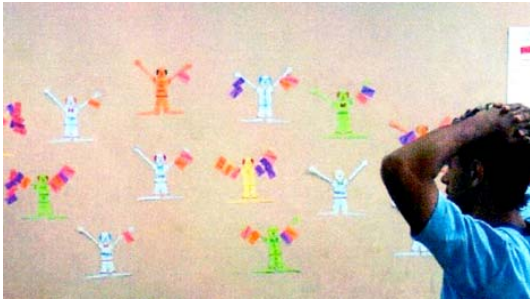
Figure 7: Test of a possible individual performance register design. This was changed to the final product after the test.

Figure 8: Test of the ranking of each exercise and the names of the students in order.

Once the definition of what actually will be constructed has been settled, the next step is the construction itself which can use a workshop at the university with the help of an instructor.

Preparing the observation of the final product in use

The experimental part is done over 3 weeks. In order to help them in the observation of what is happening and study the impact, 3 tasks have do be performed before starting the experimentation period;

i) a list of which points they will pay attention to,

ii) a list to how they will pay attention and

iii) a chronogram of when this will happen over the 3 weeks.

They have to include: taking pictures of the final object in use, time for any possible adjustments and time for the object to be left at the locale to be used with and without their presence, so that later questioning can determine it's usefulness. At the end, a letter from the interlocutor is required reporting on the development of the project.

The final result

The experiment is done with the final material in the real situation.

In the case of the Capoeira class, "hands" in wood were developed, marked with numbers and colors, in the size of the hands of the students, with a sand paper underneath and a special table cloth in order to not slip when beaten (figure 9). Some of these objects were developed over the experiments. Part of this development was also a bag to carry the objects.

Figure 9: The interlocutor and the children of the Project in a Capoeira class using the hands to guide then in drumming.

In the case of the circus class, the final product was a panel with two type of register. The individual performance of the students (figure 10.1) and their positions in the different categories of the course (figure 10.2). One was on the left hand side of the panel and the other on the right hand side. Over the experimental period it was possible to see students improving their performances because they would like to occupy more spaces on the panel

10.1

10.2

Figure 10: 10.1) The panel in which the performance of the students in the Circus class is registered in order to stimulate them to learn and exercise more. 10.2) The detail of the individual skills. The name of the child can be changed to another in order to be used over the years.

In the case of the work project made with people with visual deficiency, the product was a flexible rug that could become a cube (figure 11). The necessity for some three-dimensional stimulus was seen over the experiments.

11.1

11.2

11.3

Figure 11: The final product and its flexible format in the project with people with visual deficiency. 11.1) Rug, 11.2) Rug and "wall", 11.3) Cube.

Conclusion

This method seems complex mostly because it is new for the students. Normally they come from a education model in which it is the teacher who brings the subject to be studied and not the student who brings the subject to be discussed in class. Our method can be applied to a lot of situations, but has fitted best mostly in situations of classes where there is a teacher as the interlocutor. The interlocutor can be another person, like a seller, a social care person, etc, but with teachers application seems to be easier in this new approach. In a situation in which the interlocutor is a teacher there is a clear objective, a predefined schedule and the student has only to find somebody who likes his job, who has "shining eyes". This makes the exercise less complex and still keeps the purpose of the discipline.

This participatory approach of the student, with an outside interlocutor and group, is an important exercise for them. Over the rest of their course they will experiment with other types of approach, but this was chosen as the first one for them to work with. Among other aims, the reason is that this approach stimulates questions, a wish to research, and produces a type of individual experience in which each student will have their own learning. Experience over 10 years has shown that this overall approach, which is similar, but not identical to the strategy of Schön and Argyris, can produce in the student a positive and productive approach to communication with the client.

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