

# EXPLORING THE INFLUENCE OF SELF-CONFIDENCE IN PRODUCT SKETCHING

Pepijn VAN PASSEL and Wouter EGGINK  
University of Twente, Faculty of Engineering Design

## ABSTRACT

The development of a student's skills during design education partly depends on the amount of self-confidence. Optimizing the speed and level of growth can be done by influencing factors related to self-confidence that students have to cope with throughout their studies. Six main factors can be distinguished and have been explored in order to discover how teachers can improve sketching education. Several methods of improving sketching courses have been developed, tested and described based on these factors. Experience showed that by positively influencing self-confidence during courses, skills develop faster and to a higher level. Especially optimisations based on the field of reference factor rendered good results in our practice. Being aware of the possible influences which a teacher can have on the development of the six factors that influence these can make a noticeable difference.

*Keywords: Design education, sketching, teaching methodology, student development, self-confidence*

## 1 INTRODUCTION

For the future development of design and design education, because of increasing complexity of the profession and diminishing budgets, it is important to educate design students in such a matter that their skills grow efficiently [1]. The amount of growth in designing skills depends on several factors which can be influenced during the course of the design study. One aspect that influences the growth of a student is the amount of self-confidence developed when executing his or her new profession [2]. The more self-confidence students develop during their study, the faster necessary skills develop. So, by putting more focus on the development of self-confidence during practical design courses, skill development will be brought to a higher level in a more efficient way.

In this paper we explore the influence and building of self-confidence in our education of sketching skills for Industrial Design Engineering Bachelor students. We think that improving sketching abilities is not only reached by learning basic sketching rules and lots of training, but also by gaining confidence in the practical use of the materials and the confidence in being able to communicate and develop oneself through sketches. By offering teachers a coping strategy on improving self-confidence of students, skills will improve faster and make the students end up as better designers.

## 2 CURRICULUM

Within our bachelor curriculum of Industrial Design Engineering we conduct three courses in which sketching abilities are being trained; 'Sketching And Concept Drawing', 'Product Presentation Drawing' and 'Applied Digital Sketching'. This line of courses as a whole is built on three pillars [3]:

- Learning to sketch; Theory, speed, control of the materials
- Learning from sketching; Developing a better insight in complex 3D shapes
- Using sketching as a design tool; Communication, ordering your thoughts, iterative working

Each course uses design activities as a basis for skill development. Therefore each course consists of exercises and design assignments in which students have to express themselves extensively (Fig. 1). This set-up makes that students have to cope with different factors that influence their self-confidence. Six major factors can be distinguished, based on Albert Bandura's theory on self-efficacy [4]:

- The current mental state
- The current emotional state
- Previous experiences

- Previous accomplished performances
- The field of reference
- Verbal and visual persuasion



*Figure 1. Students expressing themselves using sketches*

These factors continuously change in time and influence the learning curve and performance. Students tend to end up into an upward or even into a downward spiral, depending on the combination of factors. As the level of self-esteem increases, so do achievement scores; as self-esteem decreases, achievement scores decline. Furthermore, can be concluded that self-esteem can be modified through direct instruction and that such instructions can lead to achievement gains [5]. It is also stated that the best way to sustain a sense of confidence is to acquire and demonstrate competence in a continuous loop. Self-confidence will emerge with success in skill development and learning. Therefore the key point is to help students set meaningful and realistic goals [6]. So teachers can partly influence these factors and thereby the development of confidence by creating a specific environment in which the student can easily flourish and also by adjusting the educational materials and techniques.

### **3 SIX FACTORS**

Taking a closer look at the six factors and relating them to the sketching course provides insight on how students cope with these factors, and how teachers can influence them.

#### **3.1 The current mental state**

The thoughts of the moment can be very distracting and creates noise in the head of the student. This prevents the student from focussing on the activities that are being performed. The ideal mental situation in which the learning student should get during sketching activities is a combination of intrinsic motivation, interest, concentration, perseverance, inner peace, joy, enthusiasm and the loss of self-consciousness. This can be reached by creating a state of ‘flow’ which is being associated with the effort of reaching a certain goal acting with total involvement that can be seen when for instance playing an instrument. This state of mind is being realised when there is an optimal balance between the difficulty of a task and the specific skills of the student. In a state of flow students can learn faster, gain new insights and even alight above themselves [7]. This state of flow can be characterised by at least some of the following features [8]:

1. Clear goals and immediate feedback
2. Equilibrium between the level of challenge and personal skill
3. Merging of action and awareness
4. Focussed concentration
5. Sense of potential control
6. Loss of self-consciousness
7. Time distortion
8. Autotelic or self-rewarding experience

The first four features can be easily encouraged by adjusting the content and the setting of the course activities, especially when they can be tailored to the individual student’s performance. This should then lead to feature 5. Feature 6 to 8 are however difficult to influence.

#### **3.2 The current emotional state**

Emotions are an important source of self-confidence, and it relates to how one controls the emotions associated with practical learning situations, such as doubt and anxiety. Very often, the importance of

the occasion creates self-doubt, which is why it is essential to control one's thoughts and emotions. Learning specific skills for improving concentration on the task at hand will help. Some well-known exercises to gain concentration are based on the principles of mindfulness. Another way of influencing emotions regarding self-doubt can be through feedback by the supervisor. Receiving positive feedback helps to diminish dominant negative emotions and broadens the scope of attention [9].

### 3.3 Previous experiences

In sketching and designing as a whole it is important to feel comfortable about showing your work and skills to others. Any disturbing experience, like for instance receiving negative feedback, will affect the student's confidence in showing work and skills. Feedback should be positive, constructive and must not be made personal but focussed on facts preferably in combination with improvement tips. The student must learn to cope with criticism and see the benefits of feedback without losing confidence. The student must understand the necessity of receiving feedback in order to gain skills and developing a self-critical attitude.

### 3.4 Previous accomplished performances

Accomplished performances are the strongest contributor to confidence. When a student performs any sketching skill successfully, the student will generate confidence and is willing to attempt something slightly more difficult. Learning to sketch should be organised into a series of assignments that progress gradually and allow the student to master each step before progressing on to the next. Personal success breeds confidence, while repeated personal failure diminishes it. There should be a graduate increase in the difficulty of the activities in order to keep the feeling that the student has to make more effort for making the next assignment to be a success. This way the students get a constant extra reward for the effort that is being made.



*Figure 2. Work of other students form a field of reference*

### 3.5 The field of reference

Being involved with the success of others can also boost confidence, especially if the student believes that the other student involved, closely matches his own qualities or abilities (Fig. 2). In effect, it evokes the reaction: 'if he can do it, I can do it'. Besides this effect it is also important that the student knows what the current abilities are in relation to the final expectations. The student should be given a complete overview of the possible final competences on a regular basis, so an estimation can be made of the current level. Also the teacher can play a more specific role in the development of a realistic field of reference. As students need a role model [10], the teacher can provide for this role and can learn the students how to structure their tasks and solve certain problems. Therefore the teacher must show skills which can be used not only as an instruction reference, but also to learn from the way how sketching is used in design practice (Fig. 3). By showing that making mistakes is also something that occurs to professionals, the student will see that making mistakes is inevitable during design explorations and necessary in order to develop more skills and is not mainly seen as a problem.

### 3.6 Verbal and visual persuasion

Persuasion is a means of attempting to change the attitude, perception and behaviour of the student and this includes changing self-confidence. Teachers often try to boost confidence by convincing students that the offered challenge lays within their capabilities. This can be done in a verbal way: 'I know you're a good sketcher so keep your head up and show me what you can'. A student might

reinforce this by repeating the message over and over to him or herself as a form of self-persuasion. If the student feels that the teacher is confident about his or her students' abilities, doubt will fade more easily. This should be stated in a positive way because the student's mind will not need to consider what is not required in order to achieve the goal that is set. Setting this goal can also be done by visually persuade the student by showing goals which are within its current reach. Setting a goal that is too high might discourage trying to reach it and make the student sceptical and demotivated.



*Figure 3. Teacher as a role model*

## **4 APPLICATION**

During sketching courses the student's confidence in their sketching abilities have been explored. This was done on the first two of the three earlier mentioned sketching courses for a duration of four years on four cohorts of 120 students. The students were divided in several parallel groups of 30 students each. At the same time we experimented with influencing the six factors by altering several educational methods and materials. These changes were partly based on the previously described knowledge on the development of self-confidence, and partly on previous experiences.

### **4.1 The current mental state**

Regularly telling why it is important to develop sketching skills and showing nice but realistic examples of what the students can reach within the line of each course helps to build interest, intrinsic motivation and enthusiasm. The state of flow is stimulated by creating a pleasant dynamic working atmosphere which stimulates concentration and creativity. This is done for instance by the use of music during design assignments and by showing inspirational pictures and products. Alternating assignments and didactic methods on a regular basis during courses improves the working atmosphere. Flow also gets positively influenced by giving personal tips for improvement and compliments on a more regular basis. This gives more grip on the balance between challenge, skill and satisfaction. For training the basic sketching skills we use clearly described small sketching tasks which are directly related to realistic design activities which gives a relation to the overall study goal. Letting the student create its own planning to fulfil tasks within a set time scheme gives a sense of control.

### **4.2 The current emotional state**

We discovered that making (personal) coaching an active part of the teacher's activities actually makes the student develop skills more easy. Close monitoring of the student gives the opportunity to make a more ideal didactic situation for each student with a slight focus on the mental and emotional state. The use of Motivational Interviewing [11], a method for dialogue focussed on interaction, helps to motivate students in a directive way and helps to reduce resistance. Starting courses with making warming-up speed sketches and by using the 'Pomodoro-Technique', a time management method based on working and relaxing within a fixed time frame, helps students to gain focus and loosen up.

### **4.3 Previous experiences**

By also emphasizing the positive sides of their sketches and skills, students tend to extract confidence from this. This gives them the opportunity to focus more on improving the lesser parts of their work and train the less developed skills. Giving extra written feedback halfway the course based on a small portfolio helped our students with focussing on their flaws. The use of student-assistants also helped in creating a more trustful environment because they have a closer and more equal relation to the students and can easily give feedback without giving the feeling of being controlled or judged.

#### 4.4 Previous accomplished performances

By slowly building up the difficulty of assignments step by step, the students are able to set small but realistic steps in growth and keep grip on what is yet to come. Example sketches for each step have been adjusted to a realistic achievable level, in combination with more ideal images to set the further goal. Giving students opportunities to choose between different subjects to design, and different sketching tools (i.e. pencil, marker, and sketch tablet) created a feeling of influence which gained more enthusiasm for the assignments. Letting students show and incorporate their previously developed sketching abilities in the product sketching courses also gave them confidence and pride. Making the students experiment with these different sketching techniques and evaluate them critically eventually helped to create a more personal sketching style.

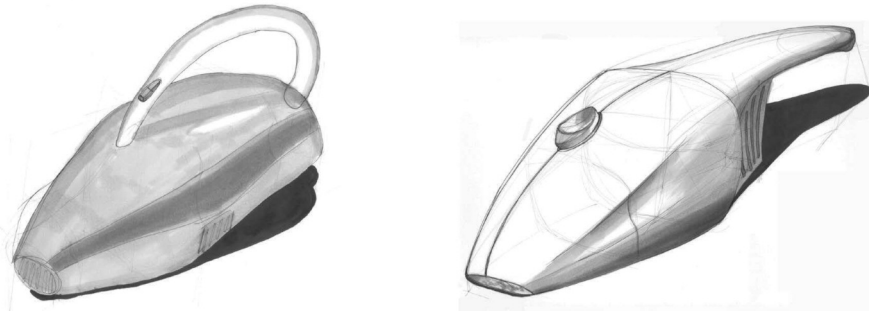


Figure 4. Bad example (lack of basic technique) and average example (reachable goal)

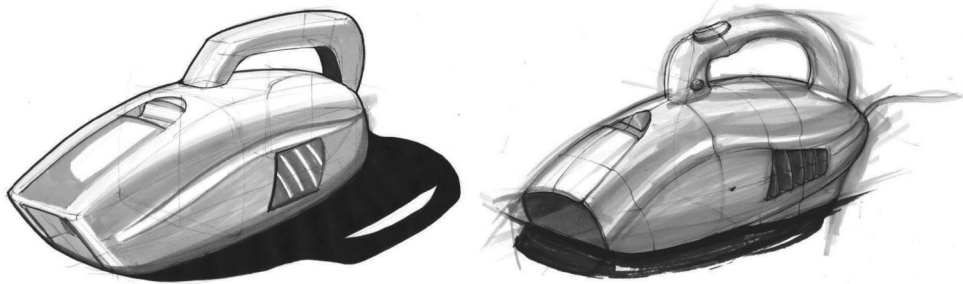


Figure 5. Good example (powerful lines) and inspirational sketch (toning with confidence)

#### 4.5 The field of reference

Letting the students give feedback on each other's homework at the start of each session helped the students in discovering their own flaws and provided an opportunity to relate their current level within the group and take conclusions. Getting feedback from equals also helps to accept feedback. It showed that this works even better in smaller settings, in which students work on assignments together and give active feedback on how they sketch. It is important that they see each other sketch during the assignments because they learn a lot by looking at others. Therefore sitting together in continuously changing groups helps to gain skills by copying techniques and attitudes from different colleagues. Starting assignments by showing an example being made live by the teacher gave a jump-start and worked inspiring to the students. By letting the teacher show that making mistakes is no problem and that there are strategies to solve them invited the students to overcome their own mistakes and learned how to cope with them.

#### 4.6 Verbal and visual persuasion

Showing stunning sketches of a very high level makes students more enthusiastic and motivated about sketching (especially in the beginning of a course series). However it is important to tell students how these sketches relate to their own work and show them how to achieve this level on a regular basis. Students learn a lot by looking at good examples especially when is explained how the sketches were

build up. By teaching the students how to analyse these sketches themselves they gained more grip on their goals and capabilities (Fig. 4 & 5). However, showing too much high end examples worked counterproductive when students had very low confidence in their skills, so mentioning the exact realistic goal is very important. Guest lectures given by professional designers showing their sketches helped the students to imagine what sketching in the working field is about and boosted moral.

## 5 DISCUSSION

Despite the large amount of positive developments that can be seen after optimising the courses based on the described six factors, it is still difficult to relate the positive changes solely to the development of more self-confidence. Measuring the development of self-confidence with questionnaires on a regular basis is possible, but it is difficult to quantify these measurements in relation to the development of a student's sketching abilities. There is a possibility to work with questionnaires in which students are asked to give an estimation on how big they assume the chance is of developing certain skills in the given circumstances. By asking these questions before and after every activity an estimation can be made on the development of and influence on self-confidence in relation to the amount of progression that was made. However, using control groups to measure differences in development in relation to education cannot be used intensively because it is unethical to give one group education in a less optimal manner. Besides this there are a lot of other variable factors when giving education to several groups which make taking reliable conclusions impossible. This means that it is more viable to monitor course improvement on the basis of student course evaluations. However, if there are basic signs to recognise students which cope with a lower level of self-confidence in sketching, it would be desirable to develop several means to acquire more information on the exact cause of this deficiency in order to take more specific individual measures.

## 6 CONCLUSION

The six described factors from the theory of self-efficacy can be well used to optimize education in which motor skills have to be trained. Experience with 500 students on teaching sketching skills for designing has shown that positively influencing self-esteem and self-confidence helps to develop skills faster and to a higher level. Being aware of the possible influences which a teacher can have on the development of the six factors that influence these can make a noticeable difference. Especially the influence of optimisations based on the field of reference (factor 5) renders good results in our sketching class practice.

## REFERENCES:

- [1] Eggink, W. and M.v.d. Bijl-Brouwer, Grading efficiency in design, *14th Engineering and Product Design Education Conference; Design education for future wellbeing*, 6 & 7 September, Antwerp. 2012 (Institution of Engineering Designers, Wiltshire UK)
- [2] Holly, W., *Self-esteem: Does It Contribute to Students' Academic Success?*, 1987. (University of Oregon, Eugene, OR., Oregon School Study Council).
- [3] Waanders, R., W. Eggink, and M. Mulder-Nijkamp, Sketching is more than making correct drawings, *13th Engineering and Product Design Education Conference; Creating a better world*, 8 & 9 September, London. 2011 (Institution of Engineering Designers, Wiltshire UK)
- [4] Bandura, A., Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, 1977, 84(2), pp.191-215.
- [5] Covington, M., Self-Esteem and Failure in School. (Eds.), *The Social Importance of Self- Esteem* 1989, (pp. 72-124). (U.C. Press, Berkeley, CA. ).
- [6] Conrath, J., *Our other youth*, 1986. (ERIC Clearinghouse, Washington, D.C.).
- [7] Csikszentmihalyi, M., *Beyond Boredom and Anxiety*, 1975. (Jossey-Bass, San Francisco, CA.).
- [8] Csikszentmihalyi, M., *The Evolving Self; A Psychology for the Third Millennium*, 1993. (HarperCollins, New York).
- [9] Fredrickson, B.L.B., C. , Positive emotions broaden the scope of attention and thought-action repertoires. *Journal of Cognition & Emotion*, 2005, 19(3), pp.313-332.
- [10] Bandura, A., Social-learning theory of identificatory processes. In D.A. Goslin (Eds.), *Handbook of socialization theory and research* 1969, (pp. 213-262). (Rand McNally, Chicago).
- [11] Miller, W.R.R., Stephen, *Motivational Interviewing, Preparing people for change*, 2002. (The Guildford Press, New York, NY.).