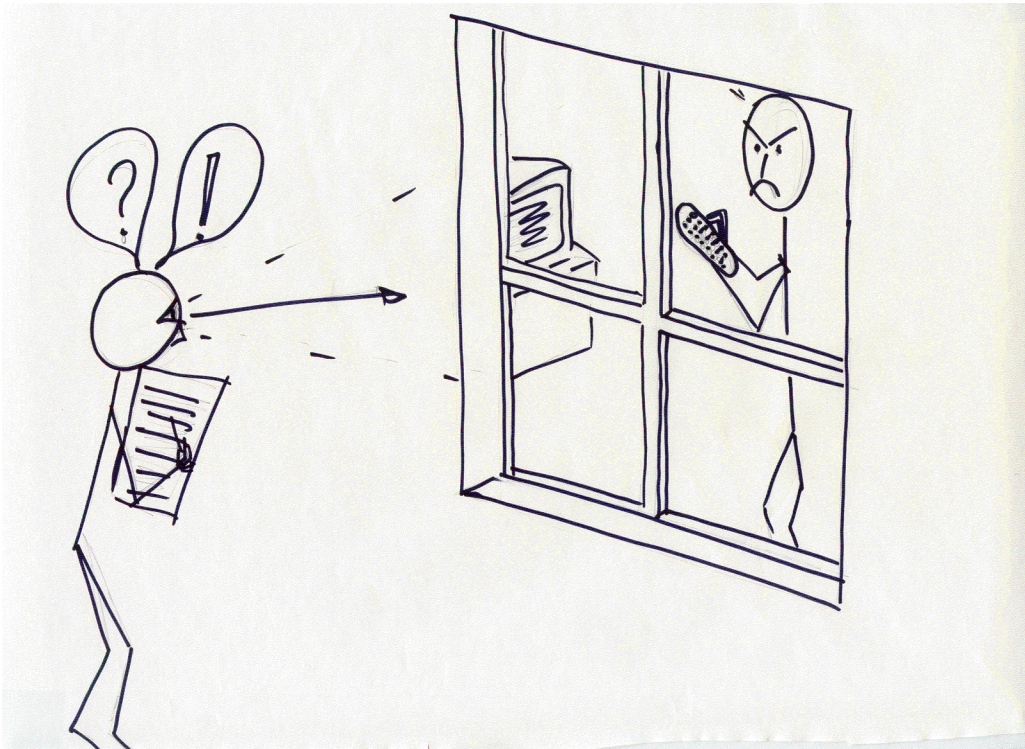


Six Golden Rules to Shake the Student's Mind



Some results from a workshop on education in Human Computer Interaction
held by IFIP Working Group 13.1
at the INTERACT'99 conference in Edinburgh, 1999.

Edited by
Lars Oestreicher

TABLE of Contents

1	INTRODUCTION	1
2	WORKSHOP PROCEDURE.....	1
3	WORKSHOP DISCUSSIONS.....	2
3.1	THE HCI TOPIC IN EDUCATION?	2
3.2	HCI VS. HMI OR HAI	2
4	RESULTS	2
4.1	WORKSHOP DISCUSSIONS	2
4.2	THE SIX GOLDEN RULES	3
1.	Read thought-provoking literature	3
2.	Observe real users using real tools	3
3.	Analyse the findings in the observation	3
4.	Mix the results from the analysis with theory	4
5.	Redesign the artefact.....	4
6.	Iterate the observation phase.....	4
4.3	COMMENTS ON THE SIX GOLDEN RULES	5
5	FURTHER WORK IN THE WORKING GROUP 13.1.....	5
6	CONTACT	5
7	WORKSHOP PARTICIPANTS:.....	5
8	REFERENCES	5

Six Golden Rules to Shake the Students' Minds

Some results from a workshop on education in HCI held by IFIP¹ WG13.1² at the INTERACT'99 conference

1 Introduction

At the INTERACT'99 conference held in Edinburgh, a workshop was organised by the IFIP working group 13.1, around education in Human-Computer Interaction (HCI). The conference attracted 13 participants, representing 9 countries (Australia, Greece, Ireland, Korea, Netherlands, South Africa, Spain, Sweden, Switzerland, UK). The workshop was initially planned for one day, but was continued informally for another half day.

The aim of the workshop was to initiate work around the didactic issues that are specific to the HCI area (see the workshop description in Cox, Oestreicher, Quinn, Rauterberg, & Stolze, 1999). It was also the intention that the problem of distance education would be addressed by the workshop. However, it turned out during the initial discussions on this topic that this issue would need a focused workshop on its own.

The participants had sent in their position statements in advance, and these have been published on the WG13.1 web-site.

2 Workshop procedure

The workshop was organised into two separate sessions, one on didactic issues in HCI, the other on the use of distance education for teaching HCI. Each of the sessions was in turn divided into group discussions where the two groups worked separately on the same issue.

After each of the group sessions, the workshop reunited for a conclusive summary of the work in the respective groups. The summaries did encourage further discussions from the groups.

At the end of the first day a final session was used to summarise the results from the workshop into a poster, from which the pictures in this document are taken. During an informal half day continuation the poster was sketched and finalised.

¹ IFIP is the acronym for International Federation for Information Processing. Information about IFIP and its aims can be found on the IFIP official web-site: <http://www.ifip.or.at/>

² The IFIP Working Group 13.1 is concerned with the education aspect of HCI, including the production of a curriculum for HCI.

3 Workshop Discussions

The discussions were vivid during most of the time, and it is impossible to describe all the different statements that were made during this workshop. However, some of the items discussed were laying the fundamentals of the final results. These statements will be related in this section.

3.1 The HCI Topic in Education?

One sub-discussion in the workshop concerned the role of HCI education. Are we to educate general HCI experts, and in such case, for what purpose? What is the role of the HCI expert? Who is the practitioner we are educating.

There was an agreement about that there is a general problem in that the teaching of HCI needs some general change in order to give the students a better possibility to *apply* the knowledge given in lectures and/or text books. How to achieve this is still to be worked out, although the conclusion from this workshop can be regarded as one step in this direction.

3.2 HCI vs. HMI or HAI

One problem with HCI is the narrow focussing on the computer, and it was also stated that the HCI needs to free itself of the burden of the computer. Thus there will be a transfer from teaching Human-Computer Interaction (HCI) to Human-Machine Interaction or even in the most general perspective Human-Artifact Interaction.

For example, we may use the interface to a violin or a flute as examples of hard-to-use interfaces which, on the other hand, allow for a very large expressivity. Thus, by taking many of the examples for the education from other areas of technology or design, we have a possibility to widen the view in the student.

Further support for this direction comes from the current trends in ubiquitous computing, where the computers become less and less visible, and the interface is increasingly merged within the product. In these cases the user is further distanced from the computer than in the traditional human-computer interaction setting.

4 Results

The results from the workshop were of two different kinds, the primary results that were presented on the poster, and the secondary results, which are the basis for future work within the Working Group 13.1. The secondary results will be presented in the shape of a curriculum for the working group.

4.1 Workshop discussions

The workshop participants all agreed upon that the current curricula for HCI education suffer from problems, especially in getting the ideas through to the users. There was a general agreement on that HCI as a field requires education not only on theoretical aspects of HCI, but furthermore there is a basic need for practical experience. It might even be said that education in HCI should have the basic aim, not of teaching HCI, but making the student “think HCI”. From this perspective most of the currently available textbooks are difficult to use in practical learning. By attempting to provide a broad and covering perspective, they give the student difficulties in apprehending the general outlook on human-computer interaction.

One immediate problem with the approach that was discussed in the workshop is the lack of textbooks that are suited for alternative education styles. The presentation in most of the books used is too traditional and aimed at a more theoretical perspective in the education.

The more practical oriented education is not addressed in this kind of books. Students, on the other hand, often want knowledge that is directly applicable, and that leads quickly to the desired goals. There was also a general agreement on that the HCI curriculum published by the ACM SIGCHI Curriculum development group (ACM SIGCHI, 1992) has problems in that it is by now outdated, although it gives a broad definition of the HCI area in educational terms.

In the smaller group sessions one part of the discussion centred on how to make the students experience HCI, rather than learning practical applications of HCI.

Almost all of the participants had their own set of experience-creating exercises that they

used in their own teaching. This was considered to be a potentially useful resource for new teachers.

4.2 The Six Golden Rules

As a conclusion from the workshop the participants produced a poster. The contents of the poster were discussed during the final hours of the first day.

The decided title of the poster was “*Six Golden Rules to Shake the Students Mind*”. The rationale behind the title was that the theory taught through textbooks needs practical experience in order to make the students see and realise the problem. Most of the practical exercises that the participants described during the workshop did have this mind-shaking quality.

1. Read thought-provoking literature

The first step is to lay a mental fundament for the mind-shaking experience. This is done by letting the student read literature that gives him or her a perspective on the theoretical knowledge that they already have. Examples of books that were advanced as useful in this respect were the sequel written by Donald Norman (1988; 1992; 1993). But there are also other sources that might be useful. Good books on industrial or graphic design could be given as inspiration for the preparations.

Note that this literature is not the traditional set of HCI textbooks.

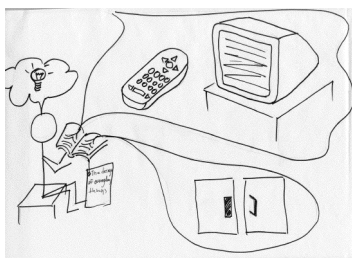


Figure 1. The student should be given good, thought-provoking literature.

One important continuation of this workshop will be to gather a source of a suitable bibliography for this mind-shaking experience.

2. Observe real users using real tools

One way of raising the awareness of HCI problems in the student is to make them go out in the real world and let them observe people using real artefacts. By noting the problems that people experience in using vending machines, doors, copiers, etc. they will experience many problems that people actually have.

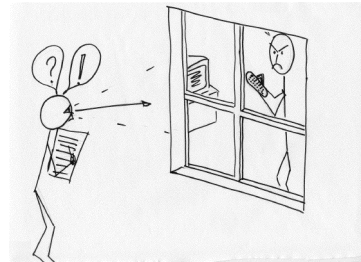


Figure 2. The student should be sent to do real observations of real users using real products.

If this real life experience is properly kindled in the following steps, it may lead the student into a continuous observation of common artefacts, i.e., they will have a better awareness.

3. Analyse the findings in the observation

By analysing the gathered data, the students will be forced to understand the problem situation, they will also be started on the process of redesign, which will be made into an awareness. The analysis can start from their own understanding, combined with the ideas from the thought provoking literature.

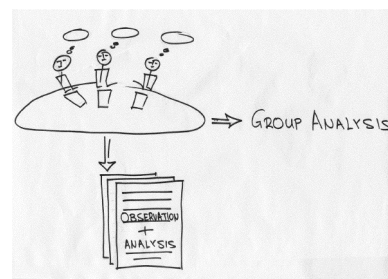


Figure 3. The studies should be analysed in groups, and the results from the analysis should be documented in written reports.

The results from the analysis should be put into written reports, so that the students are forced to rationalise their observations. The

teacher can also use the report for a mid-study examination.

4. Mix the results from the analysis with theory

The observations and the analysis has to be properly anchored in a theoretical foundation. By adding the theory after (or in parallel with) the observation study, the students will hopefully retain the theory better, and also connect their knowledge to the practical experience.

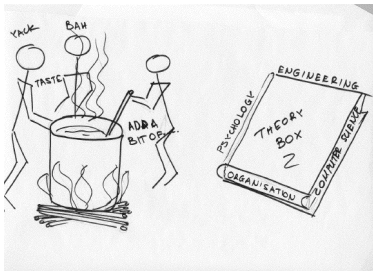


Figure 4. After the analysis theory and practice needs to be combined so that the students can get the rationale for their observations.

The mixing of theory and practice requires a good knowledge source, where the knowledge in the theory is suited for the mixing with the practical experiences. The book can of course be one of the traditionally suggested course books, such as Shneiderman (1992), Preece et al. (1994) or Dix et al. (1998) just to mention a few that were used by the participants in the group. However, more probably we would like to device a new kind of textbook, which would be adapted to this kind of teaching. To create a textbook of this kind would be one major feat for the continued work of this working group.

5. Redesign the artefact

By redesigning the artefact, the students are required not only to criticise a design, but also to make a constructive suggestion for an improvement. In the examination of the redesigned artefact, not only the usability aspects, but also other relevant properties of the artefact should be considered.

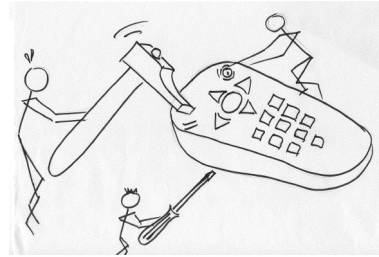


Figure 5. The results should be put to practical use, ideally into redesigning the observed product.

Since the students have been observing real world artefacts, there might be some problems in redesigning the actual artefact. Thus the redesign has to be made as a prototype or as a storyboard walkthrough. In the rare case where there is an actual possibility for a real redesign, this could of course be encouraged, but this will most likely be too time consuming for the student.

6. Iterate the observation phase

When the design is finished the students need to get feedback on their own new design, and the prototype that has been developed. This should be done by reiterating the observation, analysis and redesign phases.

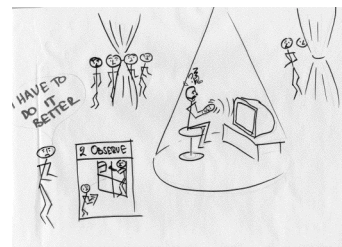


Figure 6. The final step involves iteration of the process, possibly using the redesigned artefact as a new reference.

One important part of the iteration process is that the student is encouraged to assess their own ideas in relation to the initial product. It is a very important part of HCI education to make the student realise that their solution is not (necessarily) the best solution, but that new solutions will raise new problems in the interface.

4.3 Comments on the Six Golden Rules

The application of the rules to the educational situation can of course be done in a variety of ways, incorporating some or all of the rules depending on the purpose and the situation.

The Six Golden Rules to change the Students Minds are not intended to be a new curriculum for HCI. Neither are they something that should be the sole educational tool in any introductory course in HCI.

Rather we would like to see the Rules as additional means for a teacher to raise the awareness in the student; to make them see the obvious traps in everyday design. By raising the awareness level, we suspect that the students will be more open to the general content in HCI education, rather than the specific details that are taught within the textbooks.

5 Further work in the Working Group 13.1

IFIP has as one aim to support the development of computer science within developing countries. Thus, one goal for the work within this working group is to support the education of HCI on a widespread arena over the world. One way to do this is to start publishing a series of inspiring, practically oriented educational books, or booklets, that will support teachers in their ambition to spread the ideas of HCI to their students.

The workshop inspired a large number of ideas for the continuation of the work within the IFIP Working group 13.1 along these lines. The participants were more or less agreed upon the education principle based on the change of student's mindset in the direction of HCI. In order to reach this goal, there is a need for good teaching materials.

Especially we need a useful and accessible set of good exercises, illustrative examples, and useful assignments for the students, etc. In the longer perspective we also need to create adapted textbooks, focussing more on the practical application of the ideas in HCI than on the more theoretical issues that currently constitute the common base.

This report is hopefully a first step on the way to a series of small booklets that can bring forth this kind of material.

6 Contact

If you are interested in the work done within the IFIP Working Group 13.1 you are welcome to contact us. The contact information can be found on the TC13 website: <http://www.ifip-hci.org/>.

You are also welcome to contact us if you have material that you think would fit in with the type of publication that we strive for at this stage.

7 Workshop participants:

The workshop was attended by (current location within brackets):

Julio Abascal, Spain

John Cass, Ireland (Korea)

Daphne Economou, Greece (UK)

Judy Hammond, Australia

Adrian Houtmsa, Netherlands

Maddy Janse, Netherlands

Paula Kotzé, South Africa

Lars Oestreicher, Sweden

Matthias Rauterberg, Netherlands

Markus Stolze, Switzerland

Mark Toleman, Australia

All the participants contributed alike to the achievements in this report. The editing of this final report has been done by Lars Oestreicher.

Illustrations for the poster (also included in this report) were developed by the group in common and later finalised by Daphne Economou.

8 References

ACM SIGCHI (1992). *Curriculum for Human-computer Interaction* No. ACM Special Interest Group on Computer-Human Interaction Curriculum Development.

Cox, M., Oestreicher, L., Quinn, M., Rauterberg, M., & Stolze, M. (1999). HCI in Education, Theory or Practise. In: *INTERACT'99*, . Edinburgh, UK: Kluwer.

Dix, A., Finlay, J., Abowd, G., & Beale, R. (1998). *Human-Computer Interaction* (2nd ed.). London, England: Prentice Hall.

Norman, D. A. (1988). *The Psychology of Everyday Things*. New York, New York: Basic Books.

Norman, D. A. (1992). *Turn Signals Are the Facial Expressions of Automobiles*. Reading, Massachusetts: Addison-Wesley.

Norman, D. A. (1993). *Things that Make Us Smart: Defending Human Attributes in the Age of the Machine*. Reading, Massachusetts: Addison Wesley.

Preece, J., Rogers, Y., Sharp, H., Benyon, D., Holland, S., & Carey, T. (1994). *Human-Computer Interaction*. Wokingham, England: Addison-Wesley.

Shneiderman, B. (1992). *Designing the User Interface: Strategies for Effective Human-Computer Interaction* (2 ed.). Reading, Massachusetts: Addison Wesley.