

Understanding the User Experiences (UX) Does Not Seem to be Correlated with Technical Skills: Consequences for UX Didactics

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Abstract: *In this paper we show a simple fact, namely that the student scores in a classic HCI (Human Computer Interaction) course, do not correlate with other course which comprise the staple basis of a computer science curriculum. Our claims are based on a small pilot, consisting of a n=49 sample of students who had comparable courses. An additional 41 completed the same course in the period, had different backgrounds. Our findings contribute to setting up a strong future research program for e-learning HCI/User Experience (UX) design and development: Which are the differences a traditional computer science background and interdisciplinary HCI-candidates in terms of their scores, improving didactical theories and in particular e-learning strategies, identifying the curricula which serve the best educational programs and finally, finding out if current student grades are useful (precise) for HCI/ID/UX. Finally, this paper points to the need, which is well aligned with the Erasmus program network effort FETCH, inasmuch as it aims to develop a more stringent framework to evaluate contributions to this fascinating topic.*

Key words: *Interaction design didactics, user oriented design and teaching.*

INTRODUCTION

This paper documents correlations between Interaction Design (ID) and selected other courses in the informatics curriculum. It shows that whilst other courses as well as the main project of students at the Bachelor level of a designated university college, correlates well, inasmuch as good grades of one relates to good grades of another, there is no such significant correlation between grades in Interaction Design and any of the other courses in this study. As teachers of interaction design and especially when about to launch a pan European, standardized and internetworked approach as part of the FETCH project, we ought to take this into consideration. On one side, it might mean that ID is weakly grounded on professional standards as well as loosely coupled to informatics as such. On the other hand, it allows flexibility regarding when and how to integrate it into the educational programme, since it seems not to be cumulatively dependent on previous courses. Finally, it may mean that the course, much of which is heavily relying on user oriented design principles, is not in itself particularly user oriented.

Interaction Design (ID) has become a curriculum that is taught widely in different departments, such as computer science, informatics, information systems and business schools. ID is notoriously hard to teach and learn, however, even if many textbooks are easy to read. Some authors describe ID teachers as ill-prepared to teach the design aspects, coming from a background (and relying heavily as well) on an abstract model of the process [1]. Moreover, the assessment of students performances relative to the set objectives, have been seen to be highly unstable. By this we mean that students get poorer grades than they expect, different examiners set wildly different grades and it is hard to know in advance which students would be expected to do well.

ID started out as a mixture of ergonomics and man-machine interface design, transformed through human-computer interaction to user oriented design (via participatory design and systems development) and ended up so far to be concerned with the user experience. This is a blatantly simplified history of human computer interaction, of course, but the complete story is beyond the scope of this paper. A few issues will need to be highlighted however, to the extent that they are connected to the research problem of this paper, which is exactly this: How is Interaction Design as a

didactic activity coupled (if at all) to other topics in the computer science curriculum? Unless we have a clear view of this, and can through an understanding of IDs cumulative nature prepare students for the advanced levels of reflection expected and needed at the university level, we cannot hope to have predictable, stable and precise assessment of student (nor teacher) performances,

BACKGROUND

The European Thematic Network FETCH (Future Education And Training in Computing) aims to improve the teaching of computer science and related topics in Europe. There is an increased need to be relevant, to be timely and to be precise. At the same time, the platform of education ought at the same time to be research based and systematic. On top of this, there exists a political ambition to make it accessible anytime and anywhere; adapts to individual needs, and provides equal opportunities to obtain knowledge and skills.

The background for this paper is also quite concrete. Interaction Design (ID) and User Experiences (UX) are difficult to teach. There is a gap between theory and technology. Realistic cases easily become too complex to work with in the classroom. Grades are perceived as unfair, for professors as well as students. In this paper, we aim to explain how come. Thus, it is expected to resonate well with a wider audience of Interaction Design teachers.

RESEARCH PROBLEM

The specific objectives of the FETCH project are, to be prepared for 2020:

1. Develop a European Strategic Framework for Computing Education and Training
2. Develop a European Evaluation Framework in Computing Education and Training
3. Recommend future digital curricula in Computing Education and Training.
4. Develop new didactical theories and learning models adapted to using social media in education.

These are not straightforward, in any case, and in particular when there is a sense for some of the core components, such as ID/UX that they may be difficult to reason about in a scientific manner, hard to standardize, variable and uncertain with regards to assessing fulfilment of learning objectives and technologically intricate.

Thus, we decided to investigate the results of previous students having finished the Master of Science-level course in ID/UX at our institution, in order to consider more carefully the specific characteristics of this curriculum. Without this knowledge, developing a strategic framework, standardized content and quality assurance for the evaluation of student's performances, becomes nonsensical.

METHOD

Thus, we decided to investigate the results of previous students having finished the course "Interaction Design" at one particular institution. The exam scores were collected from all previous years and the following specializations of their previous Bachelor of Science program:

- Informatics (26)
- Computer engineering (14)
- Information systems management (3)
- Digital media production (6)
- Different background (41)

These data gave us a n=90, albeit not in a complete matrix, since we could not ascertain the complete previous profiles of students with different backgrounds.

The scores of ID as well as the following courses were collected and manually compiled in a CSV-file:

- Introduction to programming/web programming
- Mathematics for engineers/IT
- Object oriented programming
- Main bachelor project

RESEARCH PROBLEM

We have, from a teaching and research experience, found that HCI/ID/UX are hard to teach, inasmuch as it seems that theoretical reflection and abstract models of human-computer interaction, are alien even to advanced students. They struggle, after having been exposed to it, to translate such knowledge to practical task and project solution strategies. Finally, when exams yield grades, many students are surprised by the grade they receive, and excoriatingly demotivate the students that we need to keep on board to populate our graduate studies.

FINDINGS

We found that there is generally either a weak or insignificant correlation between the grades of the courses that we selected for this investigation, but it is noticeably weaker and somewhat more significant in statistical terms, for the ID course and the others.

Increasing mathematical orientation (of the study) correlates with good grades in maths, not surprisingly and with OOP, perhaps more so. It seems, however that the students who chose design and digital media production do not, systematically, do better in ID than the other specializations. Instead there is nil correlation, which is statistically insignificant in the sample anyway ($n=49$, $p = 0.39$). The statistical summary is illustrated in Figure 16.

It can be summarized hence:

- Object-orientation and mathematical skills seem correlated by a factor of 0.57, which indicates that the results in one can by a little more than half, be explained (predicted) by the performance of the student in the other.
- Similarly, and not surprisingly this, the score of the object-orientation course varies (weakly) by 50% according to the study specialization of the students, which we gave a nominal rank according to the degree of mathematical preparation comprised and needed.
- Apart from these two and a half items, the most significant result is that there is no correlation at all between student scores across Interaction Design and other elements in the curricula.

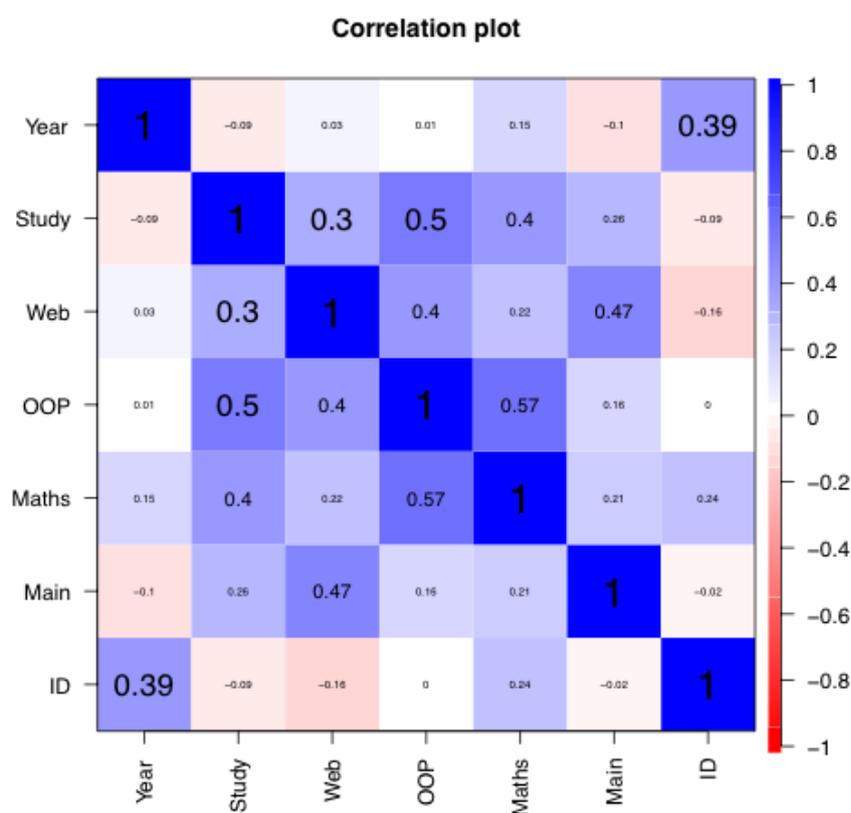


Figure 16: Statistical correlations from the student grades

DISCUSSION

There is, it seems a difference between the course in Interaction Design and other computer science (informatics) course, albeit in this preliminary pilot they are quite tentative. Whilst some of the student grades of more “technical” courses harmonize at least (even correlate, perhaps) with the grades they get elsewhere, in similar courses, their main project and (in line with prejudice, perhaps) the alleged “cleverness” needed to embark on their sub study specialization program, there is absolutely no such correlation to be found for ID.

What is the reason? Bannon describes the history of HCI in ideological terms [2], i.e., in a sense that it is the knowledge interest of researchers and managers tied in with their perspective on the human actor as either a rule-follower or a rule-maker, strong or creative and their labour as either cheap or precision, that signifies the development of our chosen subject topic from ergonomics to UX. If teaching ID/UX is teaching philosophy or politics, then we should not be surprised that it is loosely or at all connected with object-orientation and web programming. Nor should we expect textbooks with technological content to prepare students well.

What does it mean? Certainly, Gaver has a strong point when he argues that we need to eliminate the weaker theories [3], but the framework by which to identify and rank theories of relevance to HCI/ID/UX is still sadly lacking.

CONCLUSIONS AND FUTURE WORK

The practical application of the research presented in this paper is first and foremost an acknowledgement that that ID/UX may at current be too loosely grounded to be included in the strategic framework development efforts of FETCH. Since there cannot be an option to leave this important topic behind, a significant, directed effort is needed to improve this subject for teaching purposes. This may also be related to the way in which research in ID/UX is carried out, however, this is clearly too early to conclude.

We have at least six clear strands for future work, which stands out to be of interest to this community:

1. Repeating the study for a bigger sample of appropriately selected subjects, which to a larger extent yields significant correlation statistics (0.05), which we do not have in this study.

2. Identifying the differences between the groups that have, as our sample, a traditional computer science background and other HCI-candidates, which come from cognitive science, psychology, sociology and anthropology.

3. Explicating the potentials (and the pitfalls) of the unexpected correlation qualities of Interaction Design vs. the other computer science course, in general for the didactical theories and in particular for the e-learning strategies.

4. Rather than traditional computer science courses, which curricula serves as a better context for ID educational programs.

5. Assessing the appropriateness of current student assessment regimes (grades) for HCI/ID/UX.

6. Discerning a framework by which to identify and rank (evaluate) and discard theories of HCI/ID/UX, which do more harm than good.

These items come together to propose a research program for e-learning of Interaction/User Experience Design and Development. This is an important contribution of this paper.

At the current stage, our conclusions have to be more modest. Interaction Design seems only weakly related to other computer science course. Hence, we can flexibly integrate it in our educational programs. This is an advantage for e-learning, since it can be offered to a massively networked, distributed audience with a diverse background, without loss of performance, inasmuch as, indeed, that is accurately measured with traditional grades.

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The paper has been reviewed.