

# Views on Usability and User Experience: from Theory and Practice

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## ABSTRACT

What Usability and User Experience mean and how to measure these concepts are two key questions in the discipline of Human-Computer Interaction (HCI). The relevant literature provides a wide range of definitions and methods making it difficult to answer these two questions. This paper presents results of a survey asking Usability researchers and practitioners about their views and practice on Usability and User Experience aiming to investigate the current state of the art regarding both concepts.

## Author Keywords

Usability, User Experience, Definitions, Survey.

## ACM Classification Keywords

H.5.2 [Information Interfaces and Presentation]: User Interfaces – theory and methods.

## INTRODUCTION AND MOTIVATION

The term Usability has been around for over twenty years now [1]. Although it is widely seen as an essential part when developing new applications, there is no common agreement in the (HCI) community what exactly “Usability” is beyond the definition given in [4] [2]. In the broadest sense “Usability” is used to indicate something is “good” from a HCI perspective [3]. Besides the probably most common criteria effectiveness, efficiency and satisfaction, defined in [4], literature provides several different interpretations and criteria for Usability [5]. According to [5] even more interpretations can be found for User Experience (UX).

Therefore this study wanted to investigate how Usability and User Experience are understood and measured by

practitioners and researchers.

## METHOD

### Questionnaire

An online questionnaire (ten pages including instructions) was set up, comprising the sections (a) background, (b) measurement methods (c) interest and own definitions of Usability and UX (d) views on UX and Usability.

With the first section gender, age, educational background and current field of work were assessed. After that participants were asked if their job includes the development of new concepts, applications or prototypes and if yes, how they evaluate Usability of their developments (via open question). Next, different measurement methods were presented. Methods they were familiar with should be marked.

The participants were then asked if they were interested in Usability and UX. The following questions, asking the primary reason for the interest in Usability and UX, was adapted from a questionnaire published in [6]. Answer options were: per se, to design better products, to sell better products, to make people happier, other.

Subsequently their definitions (via open question) of Usability and UX were assessed. Previously the participants were asked if they are familiar with the terms. Definitions given by respondents not familiar with the terms were excluded from the analysis. That way, 110 definitions of Usability and 98 of UX were collected.

The answers were then categorized by three interraters according to the criteria described in section three. Since these criteria did not cover an adequate part of the definitions, additional criteria had to be employed including a category “other”. This category was applied for example when the answers were just simple translations from the English term to German (e.g. Gebrauchstauglichkeit). The inter-rater-reliability was  $\kappa=.75$  for Usability and  $\kappa=.78$  for UX

In the last section twenty-one Usability/User Experience criteria resulting from a literature review were listed. The participants were given the statement: “A necessary criteria for defining the concept “Usability” is [...]”. They could

indicate their level of agreement on a five-point rating scale (strongly disagree – strongly agree). Furthermore, “I do not understand” was given as an additional answer option. This was repeated with replacing the word “Usability” with “User Experience” to investigate whether Usability and UX are seen as distinctive concepts and if so regarding which criteria. The last task was to state their agreement to several statements about Usability, UX and the interrelationship between them.

The questionnaire was set up in English to reach as many participants as possible. Since the link was mainly sent out to German companies, universities and institutes, it can however be assumed that most of the respondents were native German speakers.

### Participants

The link and the password to the questionnaire were sent to colleagues including practitioners as well as researchers. After all, 166 respondents accessed the questionnaire. 118 of them filled in the whole questionnaire and were included in the further analysis.

Of the valid cases (36 female, 82 male) 51 respondents stated they are working in academia, 31 were working in industry and 33 were working in both or between areas. The age ranged between 21 and 61 (M=33.3).

## RESULTS

### Usability Measurement Methods

88 participants stated that their job includes the development of new concepts, applications or prototypes. 70 of them stated that they conduct Usability evaluations, most of them by carrying out user tests or user studies. Another common method likely to be used within user tests and studies are questionnaires and interviews.

According to these results methods without user involvement are applied relatively seldom (Table 1). In the category “other”, answers which are generally not seen as Usability evaluation methods (e.g. “common sense”) were subsumed.

These results are in line with the results of the following question, where of a list of different Usability evaluation methods participants should mark the methods they are familiar with (Table 1). Questionnaires and interviews were the methods over 75 percent of the participants were familiar with. Methods without user involvement were marked as familiar only by half of the participants or fewer.

Overall the results show that only a fraction of the known and available methods are actually used.

Methods actually used	N	Methods marked as familiar	N
User tests/ user studies	36	Questionnaires	103
Questionnaires/ Interviews	36	Interviews	92
Other	23	Experiment	90
Experiment	8	Observation	71
Heuristic evaluation	8	Think-aloud	71
Expert evaluation	7	Focus groups	67
Observation	6	Log file analysis	64
Think aloud	6	Video-/audio data	60
Focus groups	5	Cognitive walkthrough	57
Prototyping	4	Paper prototyping	54
Eye-tracking	3	Eye-tracking	52
Log-file analysis	2	Task analysis	52
Psychophysiology	1	Heuristic evaluation	51
Task analysis	1	Benchmarking	36
Card sorting	1	Psychophysiological measures	35
Cognitive walkthrough	1	Model-based evaluation	34
Model-based evaluation	1	Card sorting	33
		Personas	32
		Review-based evaluation	26
		Remote usability testing	25

**Table 1. Usability evaluation methods actually used and marked as familiar**

### Interest in Usability and UX

The vast majority stated an interest in both concepts. (Usability: 94.1%, UX: 89.8%). Participants who stated interest were then asked for their primary interest (s. Table 2). Concerning Usability, the primary interest was “to design better products”

I am interested in	Usability		UX	
	N	%	N	%
per se	16	14.4	16	14.7
to design better	67	60.4	37	33.9
to sell better products	7	6.3	10	9.2
to make people happier	13	11.7	34	31.2
other	7	6.3	10	9.2

**Table 2. Primary interest in Usability and UX**

Also regarding UX most of the respondents stated they are interested “to design better products” followed by “to make people happier”.

### Definitions of Usability and UX

The respondents' understanding of Usability and UX were assessed via two open questions asking to give a definition of those terms.

In Table 3 all criteria found in the answers are presented. The results show that the definitions of Usability are to large extent influenced by the standard given in [4]. UX is strongly associated with emotions. In contrast to Usability, pragmatic aspects like efficiency play a less important role. The category "prior knowledge" is insofar interesting as in German this is a correct connotation of the term "experience". However, in the context of Usability and User Experience, "prior knowledge" does not fit the understanding given in relevant HCI literature (see e.g. [5]).

Usability	N	UX	N
Efficiency	45	Emotion (Fun/Joy)	43 (11)
Ease of use	40	Experience	25
Effectiveness	36	Perception/Impression	21
Suitability for task	23	Prior knowledge	15
User satisfaction	28	Ease of use	13
Other	15	Other	13
Fun/Joy	9	Context	8
Intuitiveness	7	Cognition	5
Simplicity	6	Style/Trend	5
User friendliness	6	User satisfaction	4
Learnability	5	Aesthetics/Beauty	3
Context	5	Efficiency	2
Understandibility	4	Attitude	1
User-centered design	3	Learnability	1
Usefulness	2	Simplicity	1
Accessibility	1		
Helpfulness	1		
Adaptability	1		
Self descriptiveness	1		

**Table 3. Criteria given in initial definitions (open question) of Usability and UX.**

### Criteria of Usability and UX

To investigate if Usability and UX are seen as distinctive concepts, it was analyzed which criteria got the highest and least ratings of agreement for each concept. As shown in Table 5, for both concepts user satisfaction got the highest agreement, originality the least. In accordance with the initial definitions of the respondents the three most agreed criteria for Usability were the ones given in [4]. UX was associated with fun/joy, intuitiveness and aesthetics/beauty, criteria which are referred to as hedonic qualities in the relevant literature [7]. But only fun and joy were mentioned by more than three participants in the initial definitions assessed before. Intuitiveness was not brought up there.

Since the ranks only show tendencies, in a further step the ratings of agreement on the different criteria were compared with a paired sample t-test. As shown in Table 5, the level of agreement differed significantly for ten of the twenty-one criteria. Again, a stronger agreement was observed for effectiveness and efficiency regarding Usability and fun and joy regarding UX. But for UX every criterion got a mean rating over 3.6, which according to the scale labels indicates that the respondents rated all criteria as necessary.

For Usability in contrast, some criteria were rated below 3.5, indicating that they are not seen as necessary. Furthermore, over all criteria, more respondents chose the "I don't understand" answer when asked about UX (8.7%) than when asked about Usability. (5.2%)

### Relationship between Usability, UX and related concepts

In the last part of the questionnaire different statements regarding the relationship between usability, UX and associated concepts were presented. The participants were asked to state their agreement to these statements.

The results, presented in Table 4, show, that Usability is seen as prerequisite for UX and the related concept "joy of use". Intuitiveness is not clearly seen as necessary precondition for Usability.

In concordance with definition given by the respondents at the beginning of the survey, it was shown that ease of use is seen as a construct similar to Usability. As already indicated by the other measures (initial definitions and criteria) Usability and User Experience are seen as distinct concepts.

	N	M	SD
Usability is a necessary precondition for good user experience	118	4.09	1.10
Usability is a necessary precondition for joy of use	118	3.60	1.21
Usability means mainly ease of use	113	3.41	1.07
Usability is a necessary precondition for intuitiveness	114	3.31	1.23
Usability and user experience describe mainly the same concept	113	2.27	0.95

**Table 4. Agreement to different UX/Usability related statements (Max. =5/Min. =1)**

### DISCUSSION

This paper reports results of a survey regarding views on Usability and User Experience. Analysis shows that the two concepts are perceived as different, although they are overlapping. The interest in Usability is focused mainly on designing better products. Concerning UX, a nearly equally

Criteria	Usability			UX			N	t (df)	p
	Rank	M	SD	Rank	M	SD			
Accessibility	13	3.82	1.09	20	3.63	1.15	105	1.67(104)	.098
Attitude	20	2.89	0.98	14	3.80	1.04	80	7.55(79)	.000**
Beauty/Aesthetics	19	3.12	1.15	4	4.10	1.14	110	7.72(109)	.000**
Consistency	5	4.29	0.96	9	3.89	1.11	108	4.12(107)	.000**
Context	15	3.61	1.02	12	3.81	1.06	90	1.84(89)	.069
Controllability	9	3.97	0.99	5	4.00	0.99	108	-0.29(107)	.771
Effectiveness	2	4.45	0.92	16	3.76	1.13	108	7.09(107)	.000**
Efficiency	3	4.43	0.89	10	3.86	1.07	110	5.48(109)	.000**
Flexibility	16	3.57	0.98	19	3.66	1.07	106	0.86(105)	.390
Fun/Joy	17	3.41	1.09	2	4.38	1.04	109	7.67(108)	.000**
Helpfulness	14	3.80	1.04	8	3.92	1.13	107	1.03(1069)	.306
Intuitiveness	8	4.19	1.05	3	4.15	1.05	105	0.42(104)	.679
Learnability	7	4.20	0.94	7	3.95	1.10	109	2.45(108)	.016*
Memorability	11	3.90	0.98	13	3.80	1.02	106	0.99(105)	.324
Originality	21	2.54	0.97	21	3.59	1.20	104	7.90(103)	.000**
Robustness	12	3.86	1.06	18	3.67	1.08	106	1.71(105)	.091
Self-descriptiveness	6	4.23	0.89	11	3.85	1.09	107	4.37(106)	.000**
Simplicity	10	3.95	1.10	15	3.78	1.17	108	1.62(107)	.107
Suitability for individualisation	18	3.20	1.04	17	3.71	1.09	112	4.28(111)	.000**
Suitability for the task	4	4.32	0.98	6	3.98	1.06	107	3.14(106)	.002*
User satisfaction	1	4.49	0.96	1	4.62	0.89	106	1.39(105)	.167

Table 5. Agreement ratings and ranks for different criteria (Max. =5/Min. =1/\*p<.05/\*\*p<.01)

often stated interest is to make people happier. This is line with the other results: UX was generally more linked to concepts with emotional content (e.g. fun and joy).

The Usability definition most corresponding both to the results of the open question on definition of Usability and to the given criteria is the one given in [4]. The majority of respondents referred to at least one criterion given in this standard. Also, the highest agreement ratings were observed for these criteria. Regarding UX, the participants' definitions and the highest rated criteria are more associated with hedonic qualities. However, the results are not as consistent as for Usability: Intuitiveness, the criteria rated third important for defining UX, was not mentioned in the respondents' initial definitions. Furthermore some participants seemed to have confused the term UX with prior knowledge. In addition, participants agreed on all the given criteria being necessary for defining UX. Since for Usability six criteria were seen as not necessary (mean under below 3.5), this might indicate that respondents were not sure what UX is and therefore rated everything as important. Differences between both concepts were observed mainly for criteria either "very unimportant" or "very important" for defining Usability.

Overall the results show that Usability and UX are seen as distinctive concept. However, about the concept Usability

the respondents seem to have a more exact understanding than on UX.

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