

# How Do Users Solve Software Problems?

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**Abstract.** Problems with software programs can have negative consequences on a user's mood and efficiency. While the focus in research was on identifying the causes and the severity of frustration in the context of computer problems the present survey examines the strategies users employ in case of problems with software programs. Specifically, we were interested in what kind of assistance is used, in which order, and what kind of help would be preferred.

Our results show that the preferred and chosen approaches depend on factors like age, gender and perceived expertise. Furthermore the results indicate that there is a need for improvement concerning help systems integrated into software products.

## 1 Introduction

The interaction between computer users and software programs is not always straightforward and problems in dealing with computer systems can have negative consequences like frustration, personal dissatisfaction, a reduction in perceived self-efficacy [1] and even somatic discomfort [2]. In addition to these effects on the overall well-being, problems with computer software can also have economic consequences, like a loss of time from 30% up to 50% [3] caused for example by tinkering or searching for help in manuals [4].

While Ceaparu et al. [3] examined the causes and severity of frustration users experience using software systems, up to now there was only little research on the approaches chosen by users dealing with software related problems and the resources they consult in those cases. Hence the objective of the present survey was to investigate these approaches and to find out which kind of assistance users would actually prefer.

## 2 Method

### 2.1 Participants

The idea behind the setup of the survey was to get an overall impression by randomly recruiting a variety of people in a coffee shop. The survey involved 45 participants (17 female, 28 male) aged 17 to 65 years ( $M=28,91$ ;  $SD=11,8$ ). Completing the questionnaire took about 45 minutes and participants could either fill the form at the coffee shop or at home.

## 2.2 Questionnaire

The questionnaire consisted of several parts. The first part assessed demographic data like age and gender. The second part consisted of three straightforward questions (e. g. “How competent do you feel using computers”) evaluating participants’ perceived expertise in a computing context. Those three items combined constituted an expertise scale (Cronbach’s  $\alpha=.94$ ). The third part contained questions characterizing participants’ typical behaviour in case of software problems. The kind of questions asked in this context will be elucidated along with the results in the next section.

## 3 Results

The data was analysed using descriptive statistics. To check for possible group differences one-factor ANOVAS have been computed. The following groups were considered for analysis:

**Sex** male (28) and female (17)

**Age** younger ( $\leq 30$  years, 33) and older ( $> 30$  years, 12)

**Expertise** competent (24) and less competent (20) (split at the median)

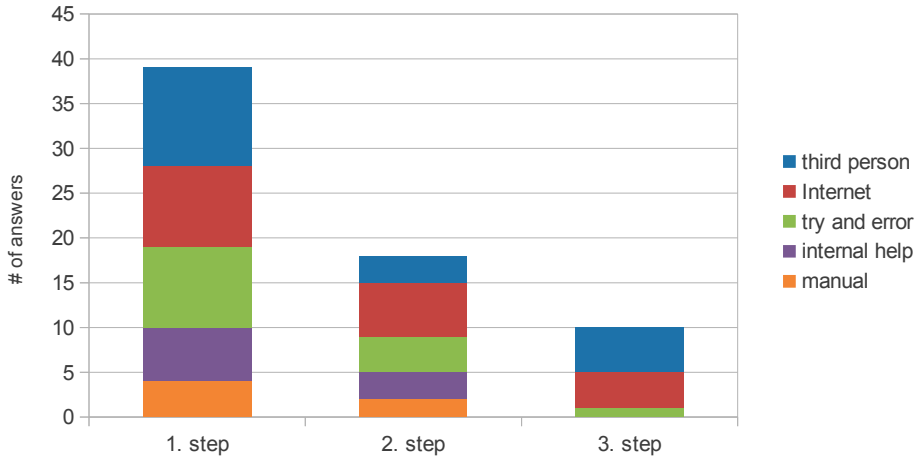
### 3.1 Scenario

In order to assess users’ typical behaviour in case of encountering problems with software new to them, we asked them to note their usual steps in a given scenario. Participants were told to imagine that they have just installed a tax return software and after starting the program, they would not know how to proceed.

The categorized answers are depicted in Fig. 1 and show that, the first step for most of the participants (11) was to ask a third person (e.g. a co-worker, family member or friend) for help. Unexpectedly using Internet resources to get help was only the second most common answer along with a try and error approach that were both noted by 9 participants. 6 participants noted they would try to find help at the internal help system of the software and 4 mentioned to use some kind of manual. Since software usually does not ship with printed manuals anymore it is unclear if those answers also refer to the internal help system or if participants meant some kind of electronic document.

### 3.2 Where Users Search for Help

The next group of questions assessed users preferences when searching for help with software problems. It listed different resources for assistance and users had to decide on a 7-point Likert scale how often they use each one in case of problems. The endpoints of the scale were indicated with “never” and “always”. Means and standard deviations of the results are summarized in Table 1. Here similar to the scenario case, searching the Internet (Mod=7) and asking a third



**Fig. 1.** Summarized steps undertaken in case of software problems

person ( $\text{Mod}=7$ ) were the answers with the highest ratings. In this context female subjects and subjects with lower perceived competence values stated to ask a third person more often for help than male subjects and subjects with higher perceived competency ( $F(1,43)=4.09$ ,  $p=.049$ ;  $F(1,42) = 9.07$ ,  $p=.004$ ).

Subjects of lower competency also use the Internet significantly less to get help than more competent participants ( $F(1,42) = 20.62$ ,  $p<.001$ ). This is also true for subjects older than 30 years ( $F(1,43)=3.1$ ,  $p=.008$ ). Accordingly, participants from the senior group ( $M=4.25$ ,  $SD=1.6$ ) expressed that they would need significantly ( $F(1,43)=5.24$ ,  $p=.027$ ) more time finding relevant help on the Internet than younger participants ( $M=3.06$ ,  $SD=1.52$ ). Thus it is of no surprise that even though the overall rating for manuals is rather low, older subjects are more likely to consult a manual in case of problems than younger subjects ( $F(1,43)=7.26$ ,  $p=.01$ ). In addition to this subjects with lower perceived competence ( $M=4$ ,  $SD=1.34$ ) stated – similar to older subjects – to need more time to find relevant help on the Internet than subjects with higher competence values ( $M=2.75$ ,  $SD=1.57$ ;  $F(1,42)=7.91$ ,  $p=.007$ ).

The internal help of software is used significantly more often by participants from the expert group than by subjects with lower competence ( $F(1,42)=8.1$ ,  $p=.007$ ). Since usually this kind of systems is supposed to assist non-expert users, this clearly shows a deficiency in help system design and suggests that there is a need for improvement in this area.

As the Microsoft Office Assistant (Clippy the paperclip) was by far one of the most well-known attempts to improve this situation, we also asked participants, if they remembered Clippy. Additionally, we also assessed if subjects perceived him to be rather useful, likeable, annoying and if they miss him on a 7-point Likert scale. Only two subjects did not remember Clippy and concerning his usefulness ( $M=3.45$ ,  $SD=1.61$ ) and likeability ( $M=3.71$ ,  $SD=1.98$ ) participants were rather

indifferent. However, the majority of subjects rated him to have been quite annoying ( $M=5.12$ ,  $SD=1.8$ ) and accordingly does not miss him ( $M=2.57$ ,  $SD=2.99$ ). The feeling of annoyance was marginally significantly smaller ( $F(1,40)=5.36$ ,  $SD=1.8$ ) for older ( $M=4.22$ ,  $SD=1.56$ ) than for younger subjects ( $M=5.36$ ,  $SD=1.8$ ).

Following a “try and error” approach ( $Mod=6$ ) as well as internal help systems were also perceived to be useful in case of problems. Getting help from journals or magazines was perceived to be less useful and female participants stated to rely even less on this kind of help ( $F(1,43)=4.09$ ,  $p=.049$ ).

Overall it can be stated that especially non-expert and older users rely less on obtaining help on the Internet and prefer asking somebody. Additionally, older subjects also prefer to use a manual over searching help on the Internet.

**Table 1.** Means and standard deviations of help usage

	overall		sex				age				expertise			
	M	SD	f		m		≤30		>30		↓		↑	
			M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Internet	5.71	1.89	6.06	1.29	5.50	2.16	6.15	1.37	4.50	2.57	4.50	2.25	6.67	.56
third person	5.24	1.69	6.00	.86	4.79	1.91	5.21	1.61	5.33	1.96	6.05	1.14	4.63	1.83
internal help	4.67	2.02	4.18	2.21	4.96	1.87	4.73	1.87	4.50	2.46	3.75	2.19	5.38	1.58
try and error	4.27	1.92	4.41	1.90	4.18	1.96	4.52	1.90	3.58	1.88	3.90	1.86	4.50	1.97
manual	3.91	1.88	3.94	1.78	3.89	1.96	3.48	1.78	5.08	1.67	3.65	1.75	4.17	2.01
technical literature	2.31	1.49	2.35	1.41	2.29	1.56	2.36	1.51	2.17	1.46	2.45	1.60	2.17	1.43
journals/magazines	2.18	1.42	1.65	.86	2.50	1.59	2.12	1.29	2.33	1.77	1.70	.86	2.46	1.61

### 3.3 What Kind of Help Users Would Wish for

We also asked for the kind of help users would like to get in case of problems. The questions in this group were focused on assessing what kind of help software companies are supposed to provide. Participants were given different options that had to be rated on 7-point Likert scales. Means and standard deviations of the results are summarized in Table 2. The results are quite similar to the results of Section 3.2. While the Internet is overall again the preferred resource for assistance subjects with lower values in expertise significantly are less into obtaining information from the Internet than participants with high values in expertise ( $F(1,42)=16.11$ ,  $p<.001$ ). The same is true for participants from the senior group ( $F(1,43)=10.66$ ,  $p=.002$ ).

Again users with lower competence values significantly less appreciate internal help systems than users with higher expertise ( $F(1,42)=4.1$ ,  $p=.049$ ). This is especially interesting since for non-expert users the absolute value for internal help systems is higher than that for the Internet help. Indicating that less competent users would nevertheless prefer to use the internal help over searching the Internet. This also seems to be true for subjects from the senior group. Furthermore, subjects from the non-expert group as well as older participants expressed a rather strong wish for manuals.

**Table 2.** Means and standard deviations of preferred help

	overall		sex				age				expertise			
	M	SD	f		m		≤30		>30		↓		↑	
			M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Internet	5.40	1.80	5.76	1.48	5.18	1.96	5.88	1.31	4.08	2.31	4.40	2.13	6.29	.80
internal help	5.24	1.61	5.12	1.49	5.32	1.70	5.12	1.72	5.58	1.24	4.75	1.77	5.71	1.36
manual	4.64	1.88	4.76	1.85	4.57	1.93	4.39	1.83	5.33	1.92	5.25	1.91	4.12	1.77
training course	4.20	1.70	4.82	1.42	3.82	1.76	3.97	1.72	4.83	1.52	4.75	1.65	3.79	1.66
e-mail/call-center	3.62	2.15	4.29	2.20	3.21	2.06	3.73	2.22	3.33	2.01	3.25	1.94	3.83	2.31

## 4 Conclusion

The results attained with the present study show that the choice of help can depend on gender, age and perceived expertise of users. While searching the Internet and asking somebody are currently the dominant ways to get assistance, especially older subjects and subjects not feeling very tech-savvy seem to prefer to get help from the software itself or have a manual provided with the software.

It also seems like there are two groups of computer users. Young expert users that rely on the Internet to get help and a second group that prefers to ask one of these experts facing trouble with computers.

Since non-expert users hardly seem to use the help systems integrated into software and these help systems are usually developed to assist primarily this kind of users, there is definitely a need for improvement in this area.

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