

# Help-Seeking in an Asynchronous Help Forum

SUSAN BULL, JIM GREER, GORD MCCALLA AND LORI KETTEL

*ARIES Laboratory, Department of Computer Science, University of Saskatchewan, Saskatoon, SK S7N 5A9, Canada {bull, greer, mccalla, lak131}@cs.usask.ca*

## ABSTRACT

In this paper we discuss the use of the I-Help peer help environment in a range of computer science courses at the University of Saskatchewan in the Fall of 2000. In particular we focus on the I-Help public discussion forums, an asynchronous help environment that stimulates students to help each other. A variety of evidence regarding the use of these forums was collected and analysed. Results suggest that I-Help is a useful resource for all kinds of user: those asking questions, those offering help and those reading postings.

## INTRODUCTION

Educational use of asynchronous discussion forums is now quite widespread, used in a variety of university contexts, for example: distance education courses (Mason & Weller, 2000; Stacey, 1999); support for undergraduate courses (Barnes, 1999; Peat, 2000); online graduate seminars (Carey, 1999); linking students and beginning professionals (Friel, 2000).

There are many arguments in favour of asynchronous learning networks, often emphasising the flexibility, and the degree of reflection and quality of messages that this allows (Harasim, 1997; Hiltz, 1997). Much of the research has been concerned with applications where student participation has been a requirement of a course, with marks awarded according to quantity and/or quality of posting behaviour (e.g. Bullen, 1998; Hara et al., 2000), as this is one method of increasing student participation. The need for some kind of moderation, facilitation or instructor involvement to maintain participation levels has also been argued (Bullen, 1998; Rekkedal, 1996; Warren & Rada, 1998), although student participation has sometimes been observed to increase to compensate for temporary instructor absence (Burton, 1998).

Less research has been directed at the use of forums that have been deployed primarily for the purpose of seeking help on various aspects of a course. This paper addresses this issue, considering the extent to which the findings for conferencing or discussion forums are relevant in the voluntary peer help context. Questions under consideration in this paper include the following: Is there sufficient use to satisfy active help-seekers and less active users? Will sufficient students offer help to make asynchronous forums a viable option as a help resource? Will help-providers benefit, as well as help recipients? To what extent will instructor participation affect student participation? Will student participation levels change over time?

## THE I-HELP FORUMS

The help environment under discussion is part of the I-Help Peer-Help Network. This comprises an agent-based one-on-one private discussion component (Vassileva et al., 1999), and the public discussion forums (Bowes, 2001), the subject of this paper. The I-Help Forums are asynchronous,

threaded, branching and textual. They may be used as task-focussed small or large group conferences, or may be used as a help-desk. The latter is the focus of this paper.

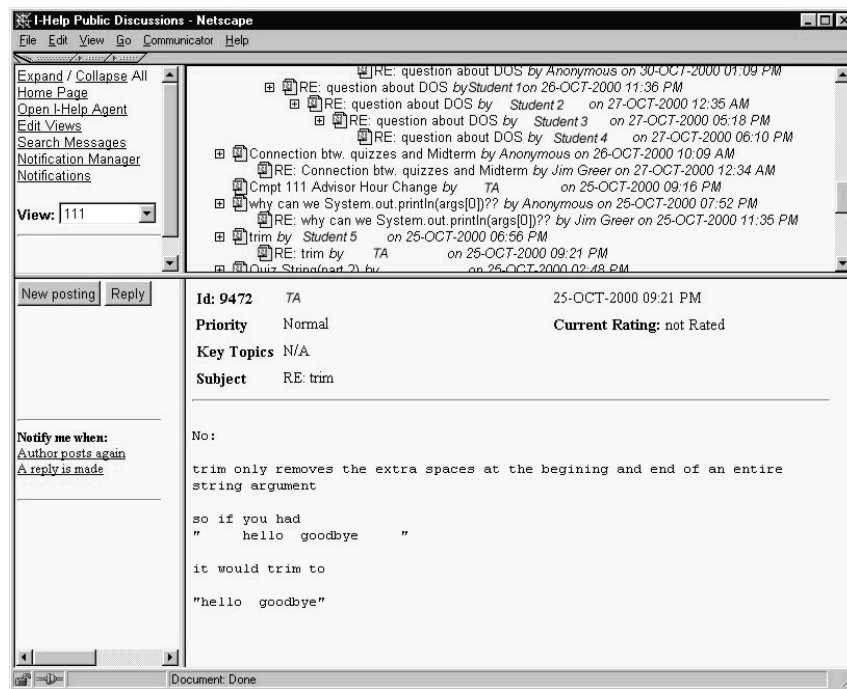


Figure 1. The I-Help Forums

I-Help Forums are available to, and can support, all undergraduate students taking Computer Science courses at the University of Saskatchewan: around 1500 students at any one time. Each course has forums where students can ask and answer questions, which are accessible only to students registered on the courses to which the forums apply. (One issue we wish to investigate is that of opening up some of the forums more widely – it has been found elsewhere that students outside a course have also provided answers to those taking the course (Boyle et al., 1995).) The I-Help Forums are shown in Figure 1 (with student and teaching assistant names removed).

The I-Help Forums contrast with many conferencing contexts which *require* participation as a means of ensuring use (e.g. Bullen, 1998; Hara et al., 2000; Rossman, 1999; Stein, 2000; Warren & Rada, 1998). I-Help is intended as a voluntary resource where students can help each other, and instructors can contribute information as required. Since many help requests are straightforward, we are not concerned with seeking reflective argumentation and critical thinking as is regarded essential for the success of many discussion forums (e.g. Duffy et al., 1998; Hara et al., 2000; Veerman et al., 1999). Our measure of success is simply related to whether those students who wish to use the I-Help Forums find the activity useful.

There are a number of factors which affect uptake of the I-Help Forums as a help resource in different courses, resulting in use ranging from just a handful of messages over the duration of a course, to extensive use by course members. Some of these factors are technical, e.g. the speed of computers available to students in a particular course; some factors are social, e.g. close-knit groups often rely on existing social relationships for help with problems; some factors are related to a lack of knowledge investment by the course instructors or other content experts; and course content also appears to affect usage to some extent. Details are given in Greer et al. (2001). There are also within-course differences in I-Help usage. This is the focus of the following section.

## USAGE OF THE I-HELP FORUMS

As cited by Stein (2000), reported research on discussion forums often focuses on idealised situations, such as those with a small number of participants. The I-Help Forums are available to all undergraduate students taking courses in the Department of Computer Science, University of Saskatchewan. This section considers use of the I-Help Forums as reported in responses to questionnaires distributed to 8 courses, at all levels. These include both courses with relatively high I-Help usage, and those with low usage. Questions related to participation levels, help-seeking and help-giving. Questionnaires were distributed to around 900 I-Help users in December, 2000. Of these, 538 questionnaires were returned, a 60% return rate.

### Non-Participation

Since I-Help is a help resource, we do not view it as negative if learners choose not to participate. Help-seeking behaviour is very individualistic – good reasons were provided by many students (in answer to open-ended questions) for their lack of participation. For not asking questions, the most frequently cited reasons included:

- I prefer face-to-face interaction
- I ask offline (friends)
- I ask offline (instructor/lab assistant)
- I use email
- I use other online methods
- I prefer synchronous interaction
- I use class notes/examples/textbook
- I prefer to work out my own problems

These are all good reasons for not using the I-Help Forums – not everyone benefits to the same extent from this kind of interaction. Other reasons for not using I-Help were less clear:

- I had no time to ask
- It takes too long to get an answer
- There is too much information in I-Help
- The answers given are not good enough

Some of these points may have been made by some of the learners giving the more positive reasons for not using I-Help. For example: "I had no time to ask"; "It takes too long to get an answer", might have been made by people who stated that they "prefer face-to-face interaction"; "ask questions offline"; "prefer synchronous interaction"; etc. The questionnaire responses for these questions have not yet been cross-related. Some of the students who felt that it took too long to get an answer may have been mainly in courses where there was low usage in general.

Hiltz (1997) states of collaborative learning:

Simply making an ALN [Asynchronous Learning Network] available and telling students that they can use it to ask questions about the readings or to discuss aspects of the course at any time does not ensure its use. If it is not a 'required' and graded, integral part of the course, the majority of the students will never use it at all; and those who start to use it, will generally decide that 'nothing is going on there' and stop using it. (Hiltz, 1997)

The fact that some students used I-Help extensively on a voluntary basis demonstrates that requiring use of the system is not always necessary. We have observed that simply announcing the availability of the system is insufficient to ensure usage, however. Students in courses where I-Help use was not particularly encouraged, and/or where instructor participation was minimal, tended to find that "nobody was there", and it took "too long to get an answer". As found by Hiltz, such students would naturally cease participating themselves. There appears to be a need to establish a critical mass of participation early on, as found also in other asynchronous discussion environments (Rekkedal, 1996; Tolmie et al., 1998).

In contrast, some students did not use I-Help because there was simply too much information to manage. This is not unusual (see Hara & Kling, to appear; Wegerif, 1998). These inconsistent

responses were sometimes offered by students taking the *same* course. This apparent contradiction between lack of participation and too much information has been found elsewhere (Mason & Weller, 2000). High levels of use of I-Help forums in some courses implies that many students did not consider this an information overload and, indeed, found it a useful resource.

Some students considered that "the answers given are not good enough". It is not known whether responses were insufficient in general, or whether they were simply not understood by the particular respondents expressing this view. The fact that many questions were posted in some courses, and the level of activity was maintained, suggests that this is not a general problem.

The remaining reasons for choosing not to use I-Help certainly require further investigation:

- I thought my questions were stupid
- I did not like to be identified as author
- I am totally lost in the course
- I am scared of computers

The feeling of some that "I thought my questions were stupid" is worrying. Assuming students are investing sufficient effort, no question is "stupid". If such learners are also reticent about other forms of help-seeking, and cannot understand material in textbooks/notes, they may be amongst those who were "totally lost in the course". The importance of anonymity for help-seekers has been argued (Barnes, 1999). The possibility of asking questions anonymously exists in I-Help, but course instructors may disable this option. Perhaps learners who had low confidence would have asked more questions had they been able to do so anonymously. In courses where this was allowed, there were anonymous questions as well as identified postings. In such courses, the concern of some learners about revealing their identity did not apply.

The final comment, "I am scared of computers", is also worrying since all users receiving questionnaires were taking computer science courses! It is likely that these comments came from students outside the Computer Science Department, who were taking courses alongside Computer Science majors. Inhibitions about posting, with reference to their more competent peers, were expressed in the questionnaires by some such students, and have also been reported for some students in other asynchronous messaging contexts (Mason & Weller, 2000; Wegerif, 1998).

It appears that many of our results relating to lack of participation in the I-Help Forums are similar to those found in other asynchronous discussion contexts. While there is no reason to require participation in help forums, it will nevertheless be useful to further investigate some of the cases of non-participation, to find ways of supporting students who could benefit from I-Help.

## Help-Seeking

I-Help is designed as a means for learners to obtain help, intended for students who like the medium, and who do not have preferred successful help-seeking strategies. There are two kinds of help-seeking: visible and lurking. Lurking characterises students who are active forum browsers or searchers in order to find existing postings to answer their questions, or who read postings regularly to obtain tips as they appear. Lurking in the help context is not a negative characteristic. Students who sought help through lurking generally had comments such as:

- My questions were generally asked and answered

The number posting messages as a percentage of those reading messages is actually quite low (31%), as shown by questionnaire responses. Assuming that students read messages because they find them to be useful, most users who find I-Help to be helpful choose a less visible presence.

The search capabilities of I-Help are powerful – postings can be searched according to author, forum, date, keywords, course topics and user-created forum views, in unlimited combinations. Users can also request email notification of postings of interest, allowing them to be alerted about issues of particular relevance to them, as they occur. Such notifications may concern postings in specific forums, on a certain topic, by a particular user, and responses to specific individual

postings, as illustrated in Figure 2. Although not all lurking users took advantage of these features, questionnaire results indicate that 130 people used the search facility, of which 115 (88%) found it to be helpful, and 117 people set notifications, of which 89 (76%) found them to be useful. Thus, if students prefer to be lurking users, they can do so quite effectively.

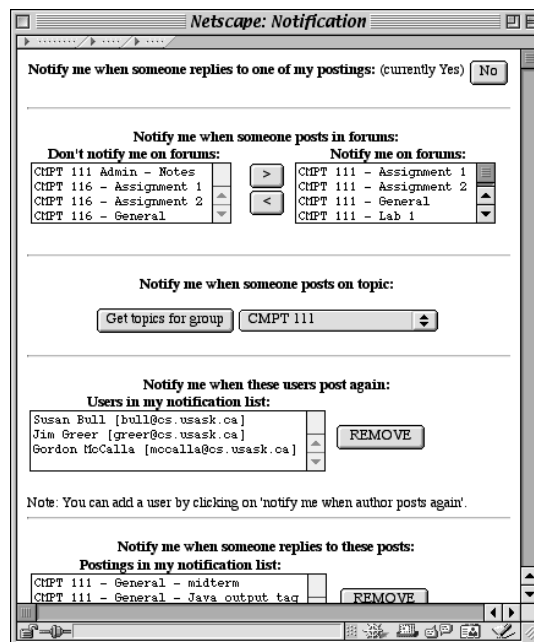


Figure 2. Notifications

Visible help-seeking involves students asking questions when help is required. Advantages cited by users, of the availability of I-Help for this purpose, include the following (most of which are applicable also to lurking users):

- You can get answers 24 hours a day
- You can get answers when you are working anywhere
- There are many users, so your question gets answered quickly
- Others have had the same problems, so they know the answer
- You can check that you are on the right track
- You get many perspectives in answers

Most commonly cited as an advantage of interaction with I-Help was the time- and place-independent nature of the asynchronous forums. This reflects findings in the literature (Harasim, 1997; Hiltz, 1997). Nevertheless, the reverse has also been suggested, namely that this very flexibility makes it hard for some students to organise themselves into participation (Bullen, 1998; Mason & Weller, 2000). In our help-seeking context, many students also stated that they never found the time to become involved. However, a large proportion of these also felt that they would have found it helpful, had they actually used I-Help.

Many students clearly appreciate the speed of response to their questions. Another point appreciated by learners is the fact that others *can* help, since they have had similar difficulties themselves. Some students actually found help from other students to be *more* useful than help from experts, because peers could appreciate the questioner's perspective on the problem.

Some students liked to be able to post a quick question to check that they were "on the right track" before proceeding too far down the wrong path, as found in other educational computer-mediated discussion contexts (Stacey, 1999). Others liked the many different viewpoints available, also reported for other large-scale deployments (Harasim, 1997).

A final reason given for asking questions in I-Help is less positive:

- I did not have enough time to solve the problem myself

Some students appear to be asking questions in I-Help in order to get other people to do the work for them. An illustration of such behaviour is the following (which received no response!):

"Everything in my program works I think except for the repetition part of the program. Can somebody provide me with code that actually works..."

Whether this kind of help-seeking behaviour occurs more frequently when a system such as I-Help is available, especially when anonymous entries are permitted, is not known. The same students might find other ways of avoiding work if I-Help were not accessible. The majority of students asking questions in I-Help do appear to be using I-Help appropriately. When other students notice work-avoidance, they tend to be quite intolerant, as illustrated by the following:

"I'm not sure of the answer, but why don't you post it here after you try both ways with YOUR program."

"Maybe you should try and see instead of asking us and waiting for a response."

This generally (though not always) ended a thread.

### **Help-Giving**

Related to help-seeking behaviour is help-giving behaviour. It appears that the majority of students giving help to others, found this process also beneficial for their own learning, and used it as a way of improving their understanding or confidence:

- I learnt from seeking information for the answer
- It boosts my confidence when I can answer someone else's question

Of the 538 questionnaire responses (which included 230 low or non-users), 140 respondents claimed to have answered questions in I-Help, 120 of whom found this 'sometimes', 'frequently' or 'very frequently' helpful to themselves. Only 12 students stated that answering questions did not help them. Thus, it appears that once noticing the benefits to their own learning, of giving help, sufficient students voluntarily continue this practice to maintain the critical mass of usage necessary for sustained interaction over time. These students may have originally chosen to provide help because they believed it would help their learning, or they may have discovered the benefit to themselves only after offering help. The interesting factor is that there are enough students who experience the benefit to foster prolonged help-giving behaviour.

However, more users chose not to give help, than to help others – some for good reasons such as "I did not know the answers"; "I was unsure whether my answers were right"; "Others could explain it better". Although not explicitly stated, they implied that they would have responded if they had been more confident. Others were less generous, but nonetheless honest: "I'm too lazy"; "I'm not interested in helping others"; "Other people would answer, so why bother?"

This section has discussed learner orientations to help-seeking. Some students prefer not to use a public help forum. Others find the medium useful. Such students are the focus of the next section, which examines help activity in more detail, in a single course.

## **THE I-HELP FORUMS IN A FIRST YEAR COMPUTER SCIENCE COURSE**

CMPT111 is a first year, first term programming course, focussing on Java. There were 348 students in the Fall 2000 offering of this course, divided into three sections. There were three

instructors, each teaching one section of the course, and two teaching/lab assistants available to answer questions during scheduled lab hours.

CMPT111 had relatively high I-Help usage. This section describes help-seeking and help-giving activity in two of the CMPT111 help forums, those relating to assignment 1 and assignment 3, the first and last major assignments of the course. These forums were selected to enable comparison of activity across time. There was a 24% dropout rate for the course, which should be considered alongside the results presented below.

In part arising from the questionnaire results described previously, and in part derived from the literature on participation in asynchronous learning networks, the following hypotheses were generated for the help context. In asynchronous help forums with instructor participation:

1. Sufficient students will request help through this medium to render it useful also to lurking users
2. Sufficient students will provide help to make I-Help a viable option as a help resource
3. There will be similar levels of reading for visible and lurking users
4. Stronger students will help weaker students
5. Both help-seekers and help-providers will benefit
6. Instructor participation will influence student participation
7. A culture of help-seeking and help-giving will develop over time

## Materials and Method

The content of messages in forums 'assignment 1' and 'assignment 3' was explored (by hand), to obtain information about the common questions and the range of question types. The I-Help user models were examined (automated), to determine typical and individual help-seeking and help-giving preferences. (See Bull et al., 2001, for details of user modelling in the I-Help Forums.) Post-course questionnaires were also reviewed. Some questionnaire items required responses to be indicated on a 5 point scale (very frequently, frequently, sometimes, rarely, never); other questions were open-ended. Of the 348 course members, 170 returned the questionnaire, a 49% return rate. Most questionnaires returned from CMPT111 students were from learners who had used I-Help (97%). Email exchanges obtained information on instructor help-giving preferences.

## Results

Table 1 shows the number of student help requests for assignments 1 and 3.

**Table 1.** Student questions

<i>Student Questions</i>	<b>Total questions</b>	<b>Total students asking questions</b>	<b>Range in # of questions</b>	<b>Median # of questions</b>
<b>Assignment 1</b>	93	47	1 - 8	1
<b>Assignment 3</b>	87	39	1 - 8	2

A similar number of questions were asked for each assignment, but fewer students asked questions about assignment 3. There were 46 anonymous requests in assignment 3; none for assignment 1. The following were the most frequent questions: request for clarification of the assignment; interpretation of error message; excerpts of code for debugging; request for how to do something (specific and open questions); checking that the solution is on the right track.

Table 2 depicts the number of student replies to these questions.

**Table 2.** Student responses

<i>Student Responses</i>	<b>Total responses</b>	<b>Total students responding</b>	<b>Range in # of responses</b>	<b>Median # of responses</b>
<b>Assignment 1</b>	90	29	1 - 26	1
<b>Assignment 3</b>	148	30	1 - 32	3

A similar number of students responded for each of the assignments, but the number of replies was higher for assignment 3. There were no anonymous replies for assignment 1; 7 for assignment 3. 29 students posted in both assignment 1 and assignment 3 forums.

Discounting anonymous postings, the results in Table 3 were obtained with reference to whether students found answering other people's questions useful for their own learning (questionnaire responses: very frequently, frequently or sometimes). While I-Help user models record posting behaviour, ethical considerations preclude us from using this data for those who have posted anonymously. Thus the figures here are lower than those in Table 2, which did not have to be retrieved individually and related to the questionnaires. (See Rourke et al. (in press) for a discussion of ethical issues in the analysis of computer conference transcripts.)

**Table 3.** Student responses and utility to student's own learning

<i>Utility</i>	<b>Total answers</b>	<b>Total students</b>	<b>range</b>	<b>median</b>
<b>Useful to me</b>	44	12	1 - 30	2.5
<b>Not useful to me</b>	7	2	3 - 4	3.5

Most respondents who answered questions in I-Help found the process helpful to themselves.

Table 4 shows the length of threads in the two assignment forums. (1 posting indicates a question that was not answered.)

**Table 4.** Length of threads

<i>Postings</i>	<b>1</b>	<b>2</b>	<b>3 - 4</b>	<b>5 or more</b>
<b>Assignment 1</b>	6%	51%	34%	9%
<b>Assignment 3</b>	9%	51%	26%	14%

Half the questions for each assignment were straightforward, seeking a simple reply. Of questions requiring more extensive discussion, more helpers became involved. Long threads were more common in assignment 3. Assignment 3 replies also tended to involve more *different* helpers.

The user models show that 196 students read postings in the assignment 1 forum (average reads = 94); and 164 students read the assignment 3 forum (average reads = 96). When compared with Tables 1 and 2, this identifies the majority of users as lurkers.

Taken from the user models of individuals, Table 5 illustrates the relationship between posting and reading, for those students who posted messages in I-Help. ('Post high' indicates higher than average posting activity among all visible users; 'read high' indicates higher than average reading for all users – visible and lurking users).

**Table 5.** Student postings and reads

<i>Postings and Reads</i>	<b>Post high Read high</b>	<b>Post low Read high</b>	<b>Post high Read low</b>	<b>Post low Read low</b>	<b>Post average Read average</b>
<b>Assignment 1</b>	11	22	1	19	6
<b>Assignment 3</b>	11	18	0	17	6

Most students who were active users were also reading more postings than the lurking users. With the exception of one user, those visible users who read fewer than average postings were also relatively low posters. This result was similar for both assignment forums.

There were a large number of persistent lurkers – people who read many postings but never posted. In assignment 1, 18% of all CMPT111 students (users and non-users) read more than 50 postings but made no postings themselves; 9% read over 100 postings, but did not post themselves. The figures were similar for assignment 3: 20% and 8%, respectively.

Table 6 shows the assignment and final exam marks for students who identified themselves in the questionnaires as non-users, lurkers, helpes, helpers and both helpee and helper. (As for Table 3, while the data for all students is stored in their user models, ethical constraints preclude



us from relating this information to student grades for those who have not explicitly consented (Consent was provided on 100 of the 170 questionnaires returned.)

**Table 6.** Student marks

<i>Marks</i>	<b>Non-users (T=14)</b>	<b>Lurkers (T=51)</b>	<b>Helpees (T=20)</b>	<b>Helpers (T=6)</b>	<b>Helpee and Helper (T=9)</b>
<b>Assignment 1</b>	82%	83%	84%	90%	96%
<b>Assignment 3</b>	63%	69%	73%	83%	91%
<b>Final Exam</b>	67%	73%	76%	87%	87%

Helpers were clearly the stronger students. Non-users were initially at around the same level as lurkers and helpees, but did not sustain this level. Analysis of variance (ANOVA) was performed to determine if there were significant differences in grades among the five categories of users. The ANOVA indicated that there was no significant difference among the five groups on the two assignments, but that there was a significant difference among the groups on the final grade in the course (at the 0.05 level). Post hoc analysis with Fischer's test indicated that lurkers and non-users scored significantly lower than help requesters and help providers (at the 0.05 level).

Table 7 gives the expert responses (professors/teaching assistants) for the two assignments.

**Table 7.** Expert responses

<i>Expert Responses</i>	<b>Prof 1</b>	<b>Prof 2</b>	<b>Prof 3</b>	<b>TA 1</b>	<b>TA 2</b>	<b>Total</b>
<b>Assignment 1</b>	0	25	2	37	0	64
<b>Assignment 3</b>	0	19	4	6	0	29

Of the five experts involved in the course, two posted no replies in assignment 1 and 3 forums, one posted a few, and two posted many. Total replies from experts were over twice as high for assignment 1 as for assignment 3. This contrasts with student responses, which were much higher for assignment 3 (Table 2). Over the course of the term peer help increased while expert help decreased (Chi-squared statistic significant at 0.0001). Table 7 also reflects the manner in which the experts chose to provide help. No response was provided by TA2, but the other experts reported their methods of helping students as shown in Table 8.

**Table 8.** Help-giving by experts

<i>Expert Help</i>	<b>Prof 1</b>	<b>Prof 2</b>	<b>Prof 3</b>	<b>TA 1</b>
<b>I-Help postings</b>	0 /week	4 /week	under 1 /week	4 /week
<b>Email messages</b>	15 - 20 /week	1 /week	2 - 3 /week	under 1 /week

Prof3 and TA1 worked during scheduled lab times, answering questions constantly. Professors generally spent 10-20 minutes answering questions after classes. There were few scheduled face-to-face meetings – 2 for the whole course duration for Prof2, and about 1 per week for Prof1. There was a computer help desk available, which was not used by CMPT111 students. Prof2 stated that email requests for help had dropped by about 90% since the introduction of I-Help.

Questionnaire results indicated the following differences in posting behaviour between the different sections of the course, illustrated in Table 9. (Questionnaire items did not distinguish between posting in different forums – results apply to all ten CMPT111 forums. It was not possible to consult the user models for this data as section membership is not represented.)

**Table 9.** Posting behaviour by course section

<i>Sections</i>	<b>Section 1</b>	<b>Section 2</b>	<b>Section 3</b>
<b>Asked Questions in I-Help</b>	59%	72%	63%
<b>Answered Questions in I-Help</b>	35%	37%	40%

Response rate was similar across sections for those who stated that they answered questions (very frequently, frequently or sometimes). More questions were asked by students in section 2.

## **Discussion**

The high dropout rate (24%) accounts for the reduced numbers of students participating in I-Help between assignment 1 and assignment 3. Given this, the total questions (93 and 87 for assignment 1 and 3 forums respectively), increased as a percentage of students still in the course. The percentage of enrolled students requesting help remained fairly stable across the two assignments, although the exact withdrawal dates of students is not known, and precise comparisons can therefore not be made. As illustrated in Table 1, the range of requests per requester was similar for each assignment, but more requests were being made per student for assignment 3.

In terms of responses to questions (Table 2), there was a clear increase in student replies, and also the number of students responding as a percentage of those remaining in the course. This reflects the suggestion for some small group synchronous computer-mediated communication contexts, that active participation may move from peripheral to more central over time (Wortham, 1999); and initially inhibited students may later gain confidence and become more active in asynchronous discussion (Wegerif, 1998).

An interesting finding is that, while there were no anonymous postings in the assignment 1 forum, 53 percent of the help requests and 5 percent of the responses in assignment 3 were made anonymously. The reasons for this are unclear – it may be that some students who had previously not had the confidence to ask questions would do so by assignment 3, albeit anonymously, or it may be that once some students used the anonymous posting option, others noticed its use and, preferring not to be identified, started using it too.

While relatively few people were responding to the help requests of others, as shown in Table 3, those providing help generally found this useful to their own learning (86%). The fact that response rate increased between assignment 1 and assignment 3 indicates that, for whatever reason, sufficient students were benefiting from helping, to continue this practice. Often, even when an answer had been posted, other students continued to reply if they had additional information, without knowing whether the help requester still had their problem.

Although visible participation in I-Help increased between assignments 1 and 3, there were still many lurkers. The volume of messages read indicates that lurkers were benefiting from their browsing and/or searching of postings. Nevertheless, visible users also tended to read more postings than users who lurked.

I-Help was conceived as a means of providing help to weaker students. While peers who chose to offer answers generally had above average performance as was expected, those seeking help were not the weakest students (Table 6). Furthermore, it was the best students who both asked and answered questions. It is interesting to observe that although non-users, lurkers and helpees had similar scores for assignment 1, in the final exam there was a distinction between these groups, with non-users achieving the lower scores. The data appears to confirm that active I-Help participation over the term eventually results in a significant improvement. This may be in part due to the greater exposure to postings of active posters, since these users read more than lurkers (and non-users). A larger sample size might also have revealed significant differences between lurkers and non-users.

Expert (instructor/teaching assistant) participation in I-Help varied, as commonly found in other contexts (Friel, 2000; Mason & Weller, 2000), with only 2 experts being very active. Expert participation was stronger at the beginning than at the end of the course. Access to these experts early on seems to have stimulated student use to the point where there was a build up of a critical mass that was sustained through the remainder of the course, even as the expert presence began to fade. However, instructor posting behaviour did appear to influence student usage. Although peer helpers were fairly evenly split across the different sections, 72% of questionnaire respondents

from section 2 asked questions, as opposed to 59% and 63% of respondents in the other two sections. Section 2 of CMPT111 was taught by the instructor who posted responses frequently in I-Help. This appears to have facilitated questioning from that group. One question this raises is how to encourage instructor participation. The active instructor was involved in the I-Help project, and so naturally had an interest in its use.

## CONCLUSIONS

The I-Help Forums are a resource for students to obtain help in their courses. It differs from many asynchronous educational discussion forum contexts studied, in that participation is intended to be voluntary. Lurking is not only tolerated, but is viewed as a legitimate form of help-seeking. Four kinds of behaviour were observed with reference to students' choices about I-Help: non participation; active message posters (questions and/or replies); active lurkers - people who were active browsers or searchers in response to a specific problem; and general lurkers - people who browsed postings regularly in order to take advantage of tips as they appeared.

With reference to our hypotheses, which were examined in the context of a first year course, the first two, that sufficient users (helpes and helpers) will participate actively to render the I-Help forums useful to active posters and to lurkers, is confirmed. The third, that reading levels will be similar for active and lurking users, was not confirmed. Active posters also appear to read more than do those who lurk. The fourth hypothesis, that stronger students will help weaker students, is only partially confirmed: while helpers received higher marks than helpes, both sets received grades higher than lurkers and non-users. Hypothesis 5, that both helpers and helpes will benefit, is confirmed. Hypothesis 6, that student participation will be influenced by instructor participation, appears to be confirmed for help-seeking in I-Help, but not for help-giving. The final hypothesis, that a culture of help-giving will develop over time, was confirmed.

Generally, reactions to I-Help expressed as responses to an open question in the questionnaires were very diverse, ranging from "I-Help sucks!" to "I-Help is my God". Overall, the truth seems to lie somewhere in between. At the very least, I-Help stimulated students to help each other – truly, therefore, an environment that can support collaboration and learning.

*Postscript:* The I-Help Forums have been available to all AIED Society members on the Society's website since October 1999, for general AIED-related discussion and for discussion of papers in the International Journal of Artificial Intelligence in Education. It is interesting to note the lack of activity in these forums!

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