Communication: A Look at the Discourse of
Computer Science Students
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Abstract

More often than not, computer science students at University of California, Davis exhibit noticeable interdependence in their courses, aiding one another in their perusal of knowledge. My research analyzes the communication mechanisms of the students of a particular computer science course through interview and observation. This then establishes the group as a functioning discourse community and reveals a vital form of their communication and its connection to students’ individual success.
Introduction

ECS 150: Operating Systems. One of the various computer science courses offered at the University of California, Davis. As its title suggests, the course is concerned with how operating systems are written and all of the concepts required to understand these various implementations. At Davis, the nature of certain computer science courses elicit unique types of interactions and relations between students. The members enrolled in these often more challenging courses tend to exhibit qualities characteristic of a specific type of group known as a discourse community.

Because it describes such a wide variety of groups, discourse community is not easily defined both shortly and precisely. However, in his paper, *The Concept of Discourse Community*, linguist John Swales details the six universal characteristics possessed by these complex groups. These characteristics are as follows: the group shares a set of public goals, members have means of communication, one or more genres are used in said communication, members participate in order to provide information and feedback, unique vocabulary is used throughout the group, and there is changing membership with members of varying levels of expertise. Again, these attributes uniquely define a discourse community and thus all groups which possess all six of these characteristics satisfy its definition.

For this study, my interests concern how this group of computer science students satisfy certain characteristics of a discourse community and how said characteristics interrelate. Specifically, intrigue is guided towards the response to significant questions, namely, how does this group of individuals practice intercommunication? What unique genre and lexical aspects are used in their forms of communication? What are the goals of the group? And how do all of these aspects relate to one another? This information brings attention to how community
members, the students, go about succeeding in their coursework, what defines their success and what may be necessary for this success.

For research, I interviewed a member of the community about their experiences related to the course and gathered examples of communication used by students. The analysis of this data revealed much about the group’s inner workings: that forum posts act as a main source of communication and course-related information, that this communication is heavily dependent on unique lexis, and that the students’ main goal is to have comprehension of the course material. This all supports that this forum used by the group is one of its most integral aspects, ultimately leading to individual achievement of the community’s established goals.

Methodology

Throughout my study, I frequently referenced Angelica Nava’s article, *Where Teachers and Students Meet: Exploring Perceptions in First-Year Composition*. This guided me in developing research and how to assemble the information obtained from the process. In addition, the work of Dana Lynn Driscoll, namely her article *Introduction to Primary Research: Observations, Surveys, and Interviews*, aided in my choice and development of research methods. Because I, myself was a member of the course, I was able to approach the research as a community member and not an outsider, giving me full access to course material, forum posts, lectures, etc. This, coupled with my familiarity with the course and its members, provided me with the insight of knowing the inner workings of the community and where to find other information to be studied.

For this study, I conducted both primary and secondary research in order to gather relevant data. The primary research consisted of a single interview with a student enrolled in the
course as well as an analysis of a forum post shared between class members. The interview was conducted via email in which the participant responded to questions regarding their experience with course. The responses to these questions reflect the experiences of those within the community, namely pertaining to their means of intercommunication and goals associated with the course. This information allowed for the analyzation of some unique ways in which this group acts as a discourse community, specifically from the perspective of its members.

The forum post that was analyzed comes from the class’s Piazza page. For those who are unfamiliar, Piazza is an academic website that functions as a class forum, hence it is commonly used for asking and responding to questions and posting course-related updates. After gathering data from the aforementioned research, I then analyzed said data, focusing specifically on their discourse-related aspects. This revealed details about how the group members communicate with one another, the common genre and unique lexis of this communication, and their established goals.

Results and Analysis

As previously discussed, I had a participant respond to a series of questions regarding some of their experiences in the course. These questions, along with the answers from the second year computer science and engineering major named Peihan Liu, are found in the Appendix. From his answers, we can see that Peihan’s goals in the class are similar to those of the professor, which are essentially to become familiar with and learn the course material. The following course description gives more detail as to what specifically constitutes the course material.
Description

Basic concepts of operating systems and system programming. Processes and interprocess communication/synchronization; virtual memory, program loading and linking; file and I/O subsystems; utility programs. Study of a real operating system.

We can also infer that the course’s Piazza page, the same place from which the above description was taken, seems to play a significant role in the student’s communication with other course members. I must also note that the forum receives dozens of posts a week, which is a testament to the degree of its importance, at the very least, as a mean of communication. Below is a post taken from Piazza, which demonstrates typical characteristics of a post seeking help for one of the course’s projects.

Casting a void*

I'm having trouble with casting a void*

So we get the address returned by MachineInitialize and store it in a void*

    sharedMemPoolBasePtr = MachineInitialize((size_t) sharedsize);

Now I need to send in this variable as a uint8_t* parameter of a function, but the way I had it did not work:

    functionName((uint8_t*) sharedMemPoolBasePtr);

I also tried creating another variable and storing the address in there, but as soon as I cast sharedMemPoolBasePtr as a (uint8_t *), the value changes to NULL.

How am I supposed to be handling this? Please help.

Immediately, we see a bold heading that acts as a subject line for the post, giving the reader a strong idea of what problem the student is having or what their post concerns. The rest of the forum post gives a short description of their problem, something which is always present. In addition, the writer gives more context by supplying short lines of code, another trait that is often seen. Some posts feature certain output from their program in place of or in addition to lines of code. These inclusions of code and/ or output are crucial, seeing as they help readers create
context for the writer’s specific problem. In certain cases, such as conceptual or logistic questions, posts have a lack of need for such characteristics and are therefore omitted.

In the previously referenced forum post, one can also see the heavy use of language that is unfamiliar to the public, or rather to those who are not a member of the community. The use of terms such as “address\(^1\)”, “NULL\(^2\)”, and “MachineInitialize\(^3\)” are used in unique ways and have meaning which lie outside of standard usage while terms such as “\texttt{uint8\_t *}” and “\texttt{void *}” and both lines of code describe fairly complex ideas and are consequently completely foreign to those outside the coding community. In his paper, *The Concept of Discourse Community*, John Swales states that “It is hard to conceive … of a group of well-established members of a discourse community communicating among themselves on topics relevant to the goals of the community and not using lexical items puzzling to outsiders.” Thus, it is not surprising that such unfamiliar language is found in the class’s discussions. The prominent use of this specialized language both renders the complete meaning of posts nearly undecipherable to outsiders as well as contributes to the establishment of the group as its own discourse community.

Let us again refer back to the goals of this group of individuals. According to the UC Davis CS department, the course intends for “students [to] be introduced to the design and implementation of modern, process oriented operating systems.” This essentially requires that those who have passed the course are familiar with how operating systems are written; a concise goal which, in reality, encompasses a vast amount of conceptual understanding. As with most fields of study, application of material gives rise to deeper comprehension. This is undoubtedly true in the context of this OS course, hence the class projects are integral to the students’

\(^1\) An address refers to a specific location in a computer’s memory.
\(^2\) NULL is an adjective used to describe data which has no value or an uninitialized value.
\(^3\) In this specific instance, MachineInitialize is the name of a function used in the student’s program.
understanding. As previously mentioned, the Piazza page receives a high amount of traffic, most of which is project-related questions. Thus, this forum acts as one of the major resources for guidance in projects in addition to its use as a communication platform.

Discussion

We have seen that the lexis used in Piazza posts helps build context of specific situations in the mind of the reader so that the post’s author receives a detailed, relevant response. The responses to these questions are then used by members to aid them in the completion of their assignments which in turn, aids in their comprehension of course concepts. This comprehension is essentially the goal which is strived for by the community members. From this, we can see the unique layering of the group’s discourse community traits and how they work to achieve the goals of the individuals.

This research discussed could be used to prompt research into similar programs and compare the inner workings of computer science students at other universities.
Appendix

1. What methods do you use to communicate with others in the class (including the professor)? (i.e. email, piazza, Facebook, in-person conversation, text, etc.)

   “Piazza for professor and people I don’t know personally in my class. Facebook message for my friends in the class.”

2. Generally, what is your motive when communicating with others? (getting help with a project, studying, relaying general information, socializing, etc.)

   “Getting help with [the] project.”

3. What is your personal goal for this class? What do you wish to achieve once you have completed this course?

   “[To] learn what operating system do and how they are implemented.”

4. In general, how willing are other students, the professor, and TAs to help you achieve your goal(s)?

   “Piazza questions are answered really quickly by the professor and other students.”

5. What do you believe is the professor’s goal for the students? Are you achieving both this goal and your own? Do you think that you are able to achieve one and not the other?

   “General understanding of the operating system; I think I’m achieving more of his goal because he assumes we know a lot of the things we don’t know, and OS is a broader subject than I expected.”

6. What resources do you consider most vital for achieving your goals? (lecture, OH with TA or professor, discussion, Piazza posts, textbook, etc.)

   “Textbook, his lecture notes, project, Piazza.”

7. Where do you usually study and work on projects? Does this usually happen with a regular group of students?

   “CSIF, a lot of people also just ssh into CSIF through their own computers.”
References


*Writing Spaces: Readings on Writing*, 2, 153-174.


Boston: Cambridge UP.