

Dialogic Behavior: Students' Utilization of Instructional Resources

Paul Gorsky

paulgo@openu.ac.il

Chais Research Center for the Integration of
Technology in Education
Open University of Israel

Avner Caspi

avnerca@openu.ac.il

Chais Research Center for the Integration of
Technology in Education
Open University of Israel

This study reports how university students generally learned and how they specifically overcame conceptual difficulty and solved problems through the use of intrapersonal and interpersonal instructional dialogues. We focused on the utilization of different resources available to students, and recognized similar patterns among different students. In addition, we examined the status of technological-based resources.

Introduction

Modern distance and campus-based instructional systems include a diverse array of learning resources such as texts, lectures, tutorials, Web-based materials, etc. In addition, there are diverse resources for interpersonal dialogue such as face-to-face meetings, telephone, e-mail, synchronous and asynchronous forums, etc. Given this diversity, we suggest that students' learning activities be investigated in terms of the kinds of dialogues they engage in and the resources that enable these dialogues. This kind of analysis was made possible through the use of a theoretical framework of instruction, centered on dialogue, articulated by Gorsky and Caspi (2005). The theory has three propositions:

1. Every element in an instructional system is *either* a dialogue *or* a resource which supports dialogue.
2. Correlations exist between certain structural and human resources common to all instructional systems and students' in-class and out-of-class dialogic behavior.
3. Correlations exist between specific, situated dialogue types and learning outcomes.

Five basic assumptions underlie the framework:

1. Instruction is a set of purposeful activities directed toward achieving learning.
2. Learning is an individual activity characterized by internal mental processes.
3. Learning is *mediated* by intrapersonal dialogue.
4. Learning is *facilitated* by interpersonal dialogue.
5. Dialogue is enabled by structural and human resources.

Intrapersonal dialogue is the interaction between student and subject-matter as the student is purposefully trying to learn. Interpersonal dialogue is the interaction between instructor and student or between student and student. It may be face-to-face or mediated by communications media; if

mediated, it may be synchronous or asynchronous. Given these propositions, *all* student-learning activities may be analyzed in terms of the *dialogues* they engage in and the *resources* (either structural or human) that enable the dialogues. Two illustrations follow:

1. A student reads a text. The text is a structural resource that enables intrapersonal dialogue.
2. Student X posts a message in an asynchronous discussion group. Student Y responds. The discussion group is a structural resource for interpersonal dialogue; Students X and Y are human resources.

This study reports on the kinds of instructional dialogues used by distance and campus-based university students while learning physics and chemistry.

Research Objectives

1. to document what dialogue types, mediated through which resources, were generally utilized by students as they learned,
2. to document what dialogue types, mediated through which resources, were specifically utilized by distance and campus-based university students to solve problems and
3. to explore the status of technology-based communication tools in mediating interpersonal dialogues.

Mode of Inquiry

Students from three different institutions and instructional environments participated in the study: (1) open university distance courses, (2) campus-based university courses with a large number of participants that were lecture oriented and (3) campus-based college courses with a small number of participants that were discussion oriented. The campus-based university courses (about 175 participants per lecture) had five hours of weekly instruction, lecture (four hours) and tutorial (one hour). Students could meet with lecturers in their offices and their telephone numbers and e-mail addresses were available to the students. At the tutorials, instructed by graduate students, answers to the previous week's exercises were reviewed. Attendance was typically 30-50 students. Instructors were generally available to students both prior to class and afterwards. Supplemental instructional materials were available to students via course web sites.

The campus-based college courses (about 8-9 participants per class) had four hours of weekly instruction. Tutorials, as such, were not offered. However, the lecturers also fulfilled this task by reviewing solutions to the assigned exercises with the students. Lecturers were generally available both prior to the scheduled class and afterwards. Students could meet with lecturers in their offices and their telephone numbers and e-mail addresses were available to the students. The human and structural resources available to the campus-based students appear in Table 1.

Table 1: Human and structural resources available to campus-based students

Dialogue Types	Human Resources	Structural Resources: Large University	Structural Resources: Small College
Intrapersonal	Student	<ul style="list-style-type: none"> • Lectures • Tutorials • Recommended texts • Website materials • Exercises 	<ul style="list-style-type: none"> • Lectures • Recommended texts • Exercises
Interpersonal	Lecturer- Student	<ul style="list-style-type: none"> • During lectures • Telephone • E-mail • Personal meetings • Submitted final exam 	<ul style="list-style-type: none"> • During lectures • Telephone • E-mail • Personal meetings • Submitted final exam
	Instructor- Student	<ul style="list-style-type: none"> • During tutorials • Telephone • E-mail • Personal meetings • Submitted exercises 	{not relevant}
	Student- Student	<ul style="list-style-type: none"> • Telephone • E-mail • Personal meetings 	<ul style="list-style-type: none"> • Telephone • E-mail • Personal meetings

Open University courses were characterized by a home study system based on textbooks, tutors, study centers and a Web Based Instructional Environment. The web environment offers both supplemental instructional materials and synchronous and asynchronous interpersonal interaction. Instructors were available for personal meetings and also by telephone and e-mail. The human and structural resources available to the Open University students appear in Table 2.

Table 2: Human and structural resources available to the Open University students

Dialogue Types	Human Resources	Structural Resources:
Intrapersonal	Student	<ul style="list-style-type: none"> • Self-instruction texts • Tutorials • Recommended texts • Website materials • Exercises
Interpersonal	Instructor-Student	<ul style="list-style-type: none"> • During tutorials • Telephone • E-mail • Personal meetings • Website forums, synchronous and asynchronous • Submitted exercises • Final exam
	Student-Student	<ul style="list-style-type: none"> • Telephone • E-mail • Personal meetings

Three lecturers from campus-based institutions and two from the open university participated in the study. Student participation included: (1) from the open university, ten chemistry students and eight physics students, (2) from the campus-based university, ten chemistry students and eight physics students and from the campus-based college, eight physics students. Participating students met two criteria: the previous successful completion of at least two science courses and a willingness to explore their own learning processes. The former criterion ensures that students had amassed enough experience so that dialogue preference would be the result of conscious decision-making and not the result of random trial and error. Data were gathered from semi-structured interviews with students and course lecturers. A grounded theory approach was utilized for data analysis (Glaser, 1978).

Findings for Research Objective 1

Distance students and university students in large lecture classes reported utilizing intrapersonal dialogue, mediated through all the available structural resources (see Tables 1 and 2), as the primary means for learning. Interpersonal dialogue was utilized for overcoming conceptual difficulty and for solving insoluble problems. For most university students, lectures were a structural resource utilized primarily for intrapersonal dialogue and possibly for some limited student-student dialogue. Although students could theoretically ask questions during lectures, a large majority (more than 90%) at any

given lecture did not. At tutorials, between one-third to one-half of the university students present at any given tutorial questioned the instructor. Students also spoke with the instructor prior to and after class. For these students, tutorials were structural resources for interpersonal *and* intrapersonal dialogue.

Campus-based college students also utilized all structural resources for intrapersonal dialogue which they considered the primary means for learning. However, they reported that significant learning occurred through interpersonal dialogue with the lecturer.

Findings for Research Objective 2

On confronting a difficult or unsolvable problem, *all* students turned to interpersonal dialogue. The majority turned first to peers for help. A secondary course of action was to ask at tutorial sessions. The primary reason cited for not turning to instructors personally was that they offer explanations, not answers. The primary reason cited for not turning to asynchronous forums was a lack of immediacy. One student's comment, "When I'm stuck, I want an answer right away", was echoed by most.

Findings about students in large campus-based lecture courses replicated findings obtained from distance education students, thereby highlighting similarities between the two seemingly different instructional systems. When analyzed in terms of the theoretical framework of dialogue, the only difference between the two student populations is in the particular structural resource that enabled intrapersonal dialogue: campus-based students generally *listen* to lectures while distance students generally *read* texts. If these findings are supported by research on a larger scale, they may serve as the basis for a theoretical explanation of the "no significant difference" phenomenon (Russell, 1999).

Findings for Research Objective 3

One might expect a large variability between students' utilization of communication means given the diversity of available tools. However, it was found that most students used the same low-technology telephone for interpersonal dialogues. Telephone is perceived as a rich medium; it offers synchronous communication and no specific skills, such as good written expression, are required. Other mediated communication means do not match these criteria. The mere fact that writing formulas in discussion groups or chats is not easy may cause students studying exact and natural sciences to avoid utilizing these tools. It is noted, however, that the kinds and amount of activities in discussion groups is also a function of teacher presence, especially their readiness to answer students' questions.

Conclusions and Implications

Findings regarding the dialogic behavior of distance and university students illustrate clearly the tension between instructional theories and actual practices. Instructional theories (Bruner, 1966; Rogers, 1969) often assign to interpersonal dialogue, especially between instructor and student, an importance that may not be realized in practice. Indeed, instructor-student dialogue in large lecture courses was very limited; by their sheer size, large groups and dialogue are generally incompatible.

References

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