Chapter 4. Case Analysis

Chapter 4 discusses data analysis and study findings related to specific case report analyses. For this study, each case was purposefully selected such that it contained all situationality elements which affected the effectiveness of the method: values about learning, learning goals, instructional methods that use social interaction, discussion of the method's effectiveness, and the associated instructional conditions. For each situationality element, I review the description of the element and provide several examples of each. Then I present a sample case analysis report and report summative frequency count data (with regards to methods and conditions) for the entire set of 30 cases. Finally, I report how information gathered through author interviews and surveys was used to refine specific case analyses and provided other useful insights into social interaction in online learning.

Situationality elements

To review briefly, the term "situationalities" is used to describe features of a particular instructional design theory or instructional environment that influence the selection and implementation of particular instructional strategies or methods (Reigeluth, 1999). When developing instructional theory or designing a learning environment, it is important to recognize and work within the constraints of the known situationalities in order to achieve desired instructional outcomes such as effectiveness, efficiency, aesthetic appeal, and ultimately student learning. The most appropriate element to begin with is values, since an educator's values are often the most important influence on the type of learning environment (and accompanying instructional strategies) s/he creates.

Values

The fundamental values about learning that an educator (teacher or instructional designer) holds form the foundation for the learning environment s/he creates. For example, an educator that values the formation of a learning community will design a learning environment to achieve learning goals and implement instructional methods that are aligned with the value of community.

In each case report selected for this study, the author stated his or her fundamental value(s) about learning while establishing the theoretical basis for the subsequent case description. Several examples of value statements found in the case reports included in this study are:

- Learning should use a learner-centered approach as it becomes a collaboration among participants (Yakimovicz & Murphy, 1995).
- The design of learning environments should support community building (Wegerif, 1998).
- Learning should be a dynamic and interactive educational process that facilitates critical thinking (Bullen, 1998).
- Community-based, active learning on the Web (Matuga, 2001)

In some cases, the value was not stated explicitly but was implicit in the literature cited and the language used to describe a particular learning environment design. Also, in some cases, the value stated by the author was focused on the means of the learning process, rather than the end of the learning process. For example, the value, "Learning should be a dynamic and interactive process" (Bullen, 1998) is a value about the means

(or processes) of learning rather than a value about the end state of learning.[9] Occasionally, the case author described fundamental learning values on multiple levels, positioning a particular case report as a focused investigation of a small aspect of a larger learning environment design perspective. For example, one report investigated the importance of student dialogue in online discussions as part of a larger research effort to understand the formation of community in the online learning environment (Murphy & Collins, 1997). In this case, the report described values of community in general and values of student dialogue and discussion in particular. In cases such as these, I chose to record the more focused value. Appendix F contains a full list of the values used in the set of all cases.[10] Chapter 5 reports the classification scheme I used to group values for cross-case analysis.

Learning Goals

Fundamental values about learning influence the learning (or instructional) goals the educator uses to guide subsequent learning environment design efforts. Learning goals not only determine the selection of content, but also guide the selection of specific instructional methods and appropriate measures of instructional outcomes (effectiveness, efficiency, and/or appeal). Derived from fundamental values about learning, such as the formation of learning community, learning goals are specific statements about what the students (or other participants) will ultimately achieve. Examples of learning goal statements from cases in this study include:

- Students develop shared meaning (McAlpine, 2000).

[9] The significance of the distinction between values about ends and values about means is explained more fully in Chapter 6.
[10] Appendix F lists all values according to the classification scheme explained in Chapter 5.

- Students learn how to build trusting and caring relationships with each other (Turbill, 2001).
- Students learn how to share and debate personal views on course content (Lewis, Treves, & Shaindlin, 1997).
- Students learn how to engage in dialogic learning processes (Murphy & Collins, 1997).
- Students learn how to resolve conflicts of opinion among their peers (Curtis & Lawson, 2001).

Learning goals were not always explicitly stated in the case report. In many cases, the description of learning goals was integrated into the description of specific instructional methods. In some cases, the case report described fundamental values about learning, and then continued on to describe the instructional methods used without discussing the specific learning goals that the methods were designed to achieve.[11] For these cases, I determined the implicit goals from the description of instructional methods and the previously described values about learning. Since I was identifying learning goals that were not explicitly stated by the case author, I included questions about these goals in the author interviews and surveys as a way to check my decisions about their goals. Appendix G contains a full list of the goals used in the set of all cases.[12] Chapter 5 reports the classification scheme I used to group learning goals for cross-case analysis.

Instructional Methods[13]

Learning goals, whether stated or not, form an important basis for choosing instructional methods. The core of each of the descriptive case studies is the report of

[11] This situation occurred frequently when authors stated values about learning focused on means rather than ends.
[12] Appendix G lists all goals according to the classification scheme explained in Chapter 5.
[13] Instructional methods are not situationalities. However, the discussion about the instructional methods in the case analysis reports seems to fit best here.

specific instructional methods that utilize (create, facilitate, sustain, etc.) social interaction among the participants in an online learning environment. One of the guiding research questions for this study concerns identifying effective combinations of instructional methods in online learning environments[14]; therefore, the instructional methods reported in each case are central to this research. Instructional methods are simply the answer to the question, "What does the educator 'do' to facilitate student learning?" Examples of instructional methods from cases in this study include:

- Students work in small groups to complete a joint project that requires communication and file sharing among group members (Ragoonaden & Bordeleau, 2000).
- Format course materials and discussion posts so they can be easily downloaded and read off-line (Carswell, Thomas, Petre, Price, & Richards, 2000).
- Include students from other locations, especially other countries, to engage in dialog about course content (Bonk, Fischler, & Graham, 2000).
- Provide a method for synchronous personal communication between students such as chat, phone, or facsimile (fax) (Curtis & Lawson, 2001).
- Each study group sends a periodic intergroup summary report to the other groups, highlighting the major topics of their own discussion and important conclusions they may have reached (Eggers, 1999).

Instructional methods were easy to identify in the case reports. In general, each case report described the instructional methods they used in great detail. Appendix H contains a list of the instructional methods found in the set of all case reports.[15] Chapter 5

[14] Research question #1 states: In an online learning environment, what are effective combinations of social interaction methods to use, for different conditions and values, in order to achieve specific learning goals?
[15] Appendix H lists all methods according to the classification scheme explained in Chapter 5.

reports the classification scheme I used to group the instructional methods from all cases for cross-case analysis.

Discussion of effects

While reporting on instructional methods was clearly a major focus in every case report, explicitly discussing the effectiveness of each of the chosen methods was not. In order to identify instructional conditions, however, I needed to be able to judge the effectiveness of each instructional method solely by what was written in the published case report, whether or not the case author discussed effectiveness in a focused manner. I used the author's description of effectiveness to determine whether there were identifiable instructional conditions associated with an instructional method. Whether or not a particular instructional method is likely to be effective in a particular situation is important to know when developing design guidance, since there are often important conditions not under the control of the educator that influence the effectiveness of a method. Examples of statements reporting effectiveness from cases in this study include:

- When students chose topics that interested them, they participated more in the discussion. Also, when students were responsible for a topic, other students purposefully supported them with their participation, hoping for subsequent reciprocal support (Cifuentes, Murphy, Segur, & Kodali, 1997).
- Student posts to the forum were focused on course content and were completed within the time guidelines established by the instructor. Some students did not value the content discussion activities, while others enjoyed them (Dennen, 2001).
- Large (n>10) group conference generated a large volume of messages and were not useful for decision making or collaborative task completion. Students sometimes turned to chat, phone, and face to face meetings instead (Harasim, 1993).

In some cases, for certain instructional methods, I could not discern a coherent discussion of the effectiveness of a particular method, so I did not include that method in the data for that case. For some instructional methods, I identified several separate statements of effectiveness, each leading to a different instructional condition. In these cases, one instructional method was associated with several statements of effectiveness, resulting in multiple instructional conditions for that particular method.

Instructional conditions

Identifying relevant instructional conditions and associating them with corresponding instructional methods in a coherent framework is the focus of the second major research question addressed in this study.[16] Using the discussion of effectiveness for each instructional method, I identified relevant instructional conditions for each method. For example, in one case study the author discussed the effectiveness of using small groups of students for collaborative course projects (Murphy, Mahoney, & Harvell, 2000). The author described how group collaboration was often ineffective when students were unable to coordinate their schedules to enable collaboration. If several students could only interact on weekends, but other students in the same group were able to interact only on weekdays, there were often several days between communication exchanges (e-mail messages, file exchanges, or discussion posts). When this occurred, the group's progress was slow and cumbersome. As I read this discussion of effectiveness, I recognized this as an instructional condition of student synchronicity – the ability of students in a group to coordinate the timing of their interactions with the other members of their group. If students cannot coordinate their schedules so that

[16] Research question #2 states: "Can these methods and conditions be arranged in a useful classification scheme in a 'situationalities' framework?"

collaboration-focused interactions are timed appropriately, the instructional method is not likely to be effective.

For many methods, one major instructional condition was evident. For some methods, in some case reports, multiple instructional conditions were implicit in the description of the instructional method and accompanying discussion of effectiveness. For example, for the instructional method, "Assess student performance with group and peer evaluation" (Graham, Scarborough, & Goodwin, 1999), there were two associated instructional conditions, "Each group member must be willing and able to be accountable for their part of the group project", and "Peers must be willing to critique each other's work." Other examples of instructional conditions identified in case reports include:

- International students with a common language must be willing and able to participate in the learning community (Turbill, 2001).
- Lecturers are willing and able to use interactive questioning techniques in a synchronous online environment to engage students during a lecture (Eggers, 1999).
- The instructor must practice effective online discussion behavior and protocol, and be able to communicate and model this behavior to students (Burton, 1998).
- Students should have similar professional or academic interests and backgrounds (Wegerif, 1998).
- Students must be willing and able to moderate and facilitate online discussions (Vrasidas & McIsaac, 1999).

Appendix I contains a list of the instructional conditions found in the set of all case reports.[17] Chapter 5 reports the classification scheme I used to group the instructional conditions from all cases for cross-case analysis.

[17] Appendix H lists all methods according to the classification scheme explained in Chapter 5.

Case-analysis report

For each case, I generated a case analysis report. Each case analysis report lists the identifying information for the case, and the values, learning goals, instructional methods (that use social interaction), discussions of effectiveness, and specific instructional conditions associated with each method. One case analysis report is included here as a sample. Appendix E includes all case analysis reports.

Sample report – C127

The case analysis report for Rada (1998), identified as case C127 for this study, is shown below in Figure 1. The analysis of C127 identified one fundamental learning value, "Peer-peer interaction," one corresponding learning goal, "Students learn how to help each other learn," and two instructional methods. Based on the discussions of effectiveness, two instructional conditions were associated with each instructional method, resulting in a total of four instructional conditions in the case.

C127 Rada, R. (1998). Efficiency and effectiveness in computer-supported peer-peer learning. Computers Education 30(3/4), pp.137-146.

Value: Peer-peer interaction

Goal: Students learn how to help each other learn.

Method: Students are required to post one exercise submission and at least one peer comment for each course topic. Participation is rewarded through the course grading policy.

Effectiveness:	**Condition:**
The level of student participation increased as the course progressed, though the depth of comments may have decreased. Students were able to significantly improve their grade by increasing their participation without regard to the quality of their posts.	Students are motivated by grades.
Effectiveness:	**Condition:**
This method resulted in over 2600 peer-generated listserv posts throughout the course, a ten-fold increase over previous course offerings.	The system must be able to track student participation.

Method: Students post weekly exercise solutions on the course website for their peers to review and comment upon in the course listserv.

Effectiveness:	**Condition:**
During the course, only 5 of 247 listserv posts included peer feedback on exercise solutions. This method did not create any significant peer interaction.	Students must be willing and able to review peer coursework and offer feedback on a timely basis.
Effectiveness:	**Condition:**
Since students were allowed to post late exercise solutions, often several weeks after the scheduled due date for the assignment, many weekly assignments were not posted until the last weeks of the course, precluding effective peer review and feedback.	Students must be willing to post assignments on time and access the course website regularly to review peer work and offer feedback.

Figure 1. Case Analysis Report for C127 (Rada, 1998).

Each report includes all major situationality elements (values, goals, effectiveness, and conditions) and instructional methods.

Summary data

While I do not draw any critical conclusions from the summative frequency count data gathered from the complete set of 30 case reports, this information is included because it provides descriptive evidence of the variety among the case reports and may be of interest to some readers. Only two case reports described more than one different fundamental value about learning. The rest (28 of 30) included only one major value. Nineteen case reports described only one major learning goal. Eight case reports included two learning goals, two reports included three learning goals, and one case report included four different learning goals. All but three case reports included more than one instructional method. The highest number of instructional methods reported in any case was seven. Many case reports included methods that were affected by more than one condition. As many as five discrete conditions were associated with a particular instructional method. Summative data regarding instructional methods and conditions can be found in Appendix J.

Author Interview and Survey Feedback

All case authors were given the opportunity to review the specific case analysis report I created for their case, review preliminary cross-case analysis findings, and comment upon a preliminary situationalities framework. Five authors were interviewed as part of phase two of this study.[18] The remaining authors (approximately 25) were contacted during phase three of this study with a request for their participation in an e-

[18] Case authors who were interviewed in phase 2 were also provided the later versions of the cross case analysis and situationalities framework during phase 3. Interviewees were sent "information" copies of the author survey as a courtesy and to provide them with an opportunity to respond to more fully-developed findings.

mail survey. The survey (as described in detail in Chapter 3) asked them to review the case analysis report for their case study, preliminary cross-case analysis findings, and a preliminary situationalities framework. In this chapter, I will summarize the feedback they offered concerning the case analysis reports. Chapter 6 reports author feedback concerning the situationalities framework and summarizes other interesting comments the authors made about social interaction in online learning. Chapter 7 reports new directions the authors are pursuing in their online learning environments.

Confirmation and correction

All case authors confirmed the accuracy of data in the case analysis report, including my decisions regarding situationality elements that were not explicitly stated in the original case study. In general, they agreed with the fundamental values and learning goals I reported in the case analysis. However, one author, during an interview, questioned the level of the value I had ascribed to the author's case. I reported that the fundamental value was "Online Learning Community." The author stated that, indeed, the educator valued the establishment of online learning community, but the case report stressed the importance of student discussion and dialogue, not the broader value of online learning community. The report described the use of one particular instructional method, chat, to implement the value of discussion and dialogue rather than the broader value of online community. Therefore, the author thought it more appropriate to assign the value "student discussion and dialogue" to this particular case report. I agreed with the author and changed the reported value.

In another case, an author commented that the value I identified in a case report was actually too focused. After reading the case report, I recorded a value of online

collaborative learning. The author suggested that it be revised to active engagement (a type of learning theory), a value with a larger scope than the one I had assigned initially. Apparently, the author's use of instructional methods that achieved goals of online collaboration were based upon the belief that collaboration would help students engage and learn the course content in an active manner. After re-reading the case report, I decided to maintain the value I had recorded, since the explicit discussion in the case report focused on facilitating collaborative learning and did not address active engagement at all. It may be important, in the future, to address the issue of fundamental learning theory as the foundation for values about learning. In Chapter 5, I discuss this in more detail when I explain the classification scheme used for values.

Summary

The specific case analysis provides the data for the cross-case analysis and the development of the situationalities framework. As such, it is crucial that this analysis is complete and accurate. Cases were selected for this study based in large part on their completeness in identifying the situationality elements in their specific instructional settings. Usually these elements were explicitly described, but sometimes they were not. In those cases, I looked for evidence in the case report that identified each element implicitly.

In order to verify my decisions about these situationality elements I carried out author interviews and surveys. The authors were very willing to participate in this research effort, and provided confirmation of my analysis and correction of a few of my decisions about what they had implied in their reports. Additionally, the authors

volunteered information about new directions they were taking in their online teaching efforts (reported in Chapter 7) and other insights into understanding social interaction in online learning (reported in Chapter 6).

Next, Chapter 5 reports the cross-case analysis and findings regarding the classification of situationality elements.