Chapter 28
Virtual Interactions in Distance Learning

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ABSTRACT

Virtual interactions play an important role in distance electronic learning. This chapter suggests an evaluation tool of virtual interactions in electronic forums and reports two case studies carried out using this tool. The first case study involves two issues: examining the differences, regarding feedback types, between high and low participating preservice teachers in an electronic forum, and examining correlations between the different characteristics of the electronic forum exchanges. The second case study involves examining the strategies of a successful distance learning instructor in interacting with students. Qualitative and quantitative research methods were used to analyze the collected data. It was found that the two groups of preservice teachers were different regarding their use of some types of feedback and similar regarding the use of other types. Significant correlations were found between some characteristics of the forum exchanges. The successful instructor used different interaction strategies that depended on the educational situation described by the participants.

INTRODUCTION

Kearsley (2005) points that information processing theories and behavioral theories tend to emphasize the importance of feedback for learning. Meiers (2005) says that feedback improves learning, partly through encouragement and recognition of achievement. Beggs et al. (2005) say that "providing undergraduates with sufficient feedback soon after they submit their work for assessment is an important element in supporting them to become reflective and independent learners". This importance of feedback is emphasized in the case of asynchronous web-based learning, where feedback is an important implication of the discussions taking place in electronic learning environments. Radojevic (2003) says that discussions within an electronic forum materialize and demonstrate the virtual presence of learners in the virtual classroom, while Wu and Hiltz (2003)

describe the electronic discussions as an element which plays an important role in learning that occurs in the distance learning courses. Further, Bouhnik and Marcus (2006) point at interaction as a dimension of electronic learning that can be utilized to maximize the positive and minimize the negative results of the students' learning. dos Reis and Martins (2008) say that interactions in the forums encourages the emergence of different perspectives, and thus facilitates diversified contributions to the resolution of problems which is enabled by the exchange of experiences and the debate of ideas.

Regarding the use of interactions in the classroom, Enomoto and Tabata (2000) reported that interaction helped students build a community of equals, where the interaction included supporting, complimenting, reinforcing and responding to each other. Enomoto and Tabata (ibid) pointed at interaction as a component of a distance learning course which helped transform a teacher-dominated course into a student directed, peer learning one. Laguardia, Machado and Coutinho (2009) said that students looked at interaction as a factor of virtual learning which supports the constructing of knowledge in discussion forums. Casarotti, Filipponi, Pieti, and Sartori (2002) considered the possibility of interaction during the lesson as a basic factor for the success of a distance course. They added that such possibility could raise among learners a greater degree of attention, interest, participation, concentration, satisfaction and perceived efficacy.

Virtual interactions are a distance learning component that represents learning social and cognitive aspects (Garrison, Anderson, & Archer, 2001; Oren, Mioduser & Nachmias, 2002). This makes it essential to examine interactions in electronic forums which are part of distance learning courses to evaluate and analyze the social and cognitive presence of the learning that takes place within the distance learning courses. One way to examine interactions is to look at the function of exchanges in the electronic forum.

In this article I suggest a tool for facilitating this examination; based on the function of exchanges, and use the tool to analyze students' interactions in one electronic forum, a successful teacher's interaction in another electronic forum, and the relations that exist between the different characteristics of the students' interactions in the first electronic forum.

BACKGROUND

Some education researchers attempted to characterize educational feedback. Hounsell (2004), in a workshop on 'reinventing feedback in the contemporary university' suggests the following key functions for feedback: (1) evaluating progress, performance or achievement, (2) encouraging and supporting, and (3) instilling a grasp of high-quality work and how it might be achieved. Draper (2005) describes the following types of feedback: (1) a mark or grade or success/fail classification of outcome. This type of feedback shows if there is a difference between the actual performance and the desired performance, but does not point at what the difference consists of, (2) the right answer without explaining why it is correct, (3) a surface explanation of the right answer, (4) a detailed explanation of what makes the right answer correct, and (5) an explanation of what is wrong about the learner's answer. At the 'Teaching for Learning' website of the Flinders University we find the following types of Feedback: (1) Informal feedback through worked examples (e.g. verbal feedback in class, personal consultation), (2) Formal feedback as in writing commentary, (3) Direct feedback to individual preservice teachers, (4) Indirect feedback to whole class, (5) Formative feedback given during the run of a topic, and (6) Summative feedback given at the end of a topic. Schitai (1998) argues that feedback has to be tailored according to specific mistakes and must attempt to analyze the learners' thinking process. Schitai

(ibid) divides feedback in educational courseware into the following types: (1) Stating, as in "You correctly answered 15 out of 20 questions in 20 minutes and 34 seconds", (2) Informing, as in "Incorrect, click here to review chapters 12 and 19", (3) Correcting, as in "Incorrect, the right answer is …", (4) Reinforcing, as in "Correct, because when doing … it becomes clear that …", (5) Directing, as in "Incorrect, click here to practice this element", (6) Analyzing, as in "Incorrect, you are right thinking that … but notice the ….", and (7) Resulting, as in "Lab explodes".

There are also some attempts to characterize feedback in electronic forums. For example Theodore and Nelson (2004) found the following types of feedback in bulletin board discussions: (1) references to personal experience; (2) interaction: when the participant made some sort of direct reference to other participants; (3) logical argument: when the participant took a position and supported it with a reasoned argument, or when the participant used logic to discuss different sides of an issue; (4) multiple perspectives: when several preservice teachers, each with a different point of view on an issue, presented their positions; and (5) an expression of opinion: when a participant stated an opinion on an issue. Makitalo et al. (2002) categorized feedback in an asynchronous web-based discussion forum into the following groups: (1) agreement/disagreement feedback in which a respondent is agreeing or disagreeing on something with the sender; (2) personal feedback in which the post is addressed to the sender, including thank-you and emotional posts; (3) notifying feedback in which the respondent tells that the post was read, points out that the issue is interesting or that it needs sorting out or verification; (4) supporting feedback in which the respondent expresses her personal support to the sender for some reason; (5) comparing feedback in which the respondent shares her own experiences or ideas and compares them to those of the sender; and (6) paraphras-

ing feedback in which the participant explains the sender's ideas in her own way. I depend on different feedback models (Hounsell, 2004; Makitalo et al., 2002; Schitai, 1998; Theodore & Nelson, 2004), and on content analysis of feedback contributed to an electronic forum to suggest a tool for analyzing feedback in electronic forums. This tool is differentiated from the other tools (models described above) by the distinguished characteristics of its categories. Using the tool I will analyze feedback in an electronic forum which was part of a distance learning course for K2 preservice teachers, examine the differences, regarding feedback types, between high participating preservice teachers and low participating preservice teachers in the electronic forum, examine the correlations between the different characteristics of the exchanges in the same electronic forum, and examine the strategies and methods of a successful distance learning instructor in interacting with middle school preservice teachers.

Research Rationale and Goals

The importance of the role of interaction in distance learning, as described above, makes it necessary to provide a tool which facilitates analyzing and evaluating interaction in distance learning settings, especially electronic forums. There are some attempts to provide such a tool, where the attempts originate from different educational perspectives. Depending on different models (Hounsell, 2004; Makitalo et al., 2002; Schitai, 1998; Theodore & Nelson, 2004), and on the constant comparison method (Strauss & Corbin, 1998), I describe a tool which attempts to provide analysis categories that take into consideration a specific perspective of interaction: the exchange's function. I then use the developed tool in two different case studies: to analyze the characteristics of interactions of students in one case and the characteristics of interactions of one successful teacher in another case. This analysis gives the reader an example of

how to use the suggested tool to analyze virtual interactions and, at the same time, demonstrates the strategies of a successful distance learning instructor and the differences between the feedback of high participating preservice teachers and low participating preservice teachers in a distance learning electronic forum. This article also describes the relations between various characteristics of interactions, and thus points at the characteristics of the interactions that make them useful for students' learning.

Thus, the research goals are:

1. To suggest an analysis and evaluation tool which helps analyze and evaluate interactions in electronic forums. This tool will originate from a specific perspective: the function of the forum exchanges
2. To describe, depending on the suggested analysis and evaluation tool, the differences, regarding feedback types, between high participating preservice teachers and low participating preservice teachers in an electronic forum,
3. To describe, depending on the suggested analysis and evaluation tool, strategies and methods of a successful distance learning instructor in interacting with students.

The Research Questions

The research questions are:

1. What are the differences, regarding feedback types, between high participating preservice teachers and low participating preservice teachers in an electronic forum?
2. What are the relations between the characteristics of students' exchanges in a distance learning forum?
3. What strategies does a successful instructor use to facilitate learning in a distance learning forum?

SETTING THE STAGE METHODOLOGICALLY

This section takes care of various aspects related to the following methodology issues: the research setting and participants, the tasks given in the two electronic forums whose electronic interactions are described in this chapter, the research methodology tools used to arrive at the categories of the suggested tool and at the interaction categories in both electronic forums described in this chapter, the interrater reliability of the coding done to arrive at the categories, the characteristics of forum exchanges needed to describe the exchanges, and the statistical treatment done to arrive at the relations between the characteristics of the electronic forum exchanges.

Research Setting and Participants

This chapter will report two case studies which were conducted in two distance learning courses: a geometry class of K2 preservice teachers and a mathematics didactics class of middle school preservice teachers. Both of the courses were full time distance learning courses. In the frame of the geometry course, the preservice teachers discussed geometry topics taught in K2 and issues in K2 geometry teaching and learning. The preservice teachers in the K2 geometry course were required to perform four tasks and participate in four forums' discussions. Participation in forum discussions meant (1) describing their ideas about the forum's topic, (2) giving feedback to at least three participants in the forum – let us call this 'first feedback', and (3) commenting on the feedback posted to them if they were required to do so by those who gave them feedback or if the issue raised required furthering – let us call this 'answer feedback'. In the frame of the math didactics course, the preservice teachers discussed mathematics topics taught in the middle school and issues in middle school teaching and learning of mathematics. The preservice teachers in the

math didactics course were required to perform two tasks and one project, and participate in the discussions of three forums. The conditions of participating in the forums were identical to those in the geometry course.

Regarding the participants, in the K2 geometry class, there were 50 preservice teachers in the fourth and last year of their study. The participants in the reported case were the five preservice teachers who contributed the greatest number of posts to the forum, 56-116 posts each, and the five preservice teachers who contributed the smallest number of posts, 15-18 posts each. It was decided to examine these preservice teachers' contributions in order to arrive at what distinguishes the forum contributions of active and inactive students. The math didactics class included preservice teachers who were in their fourth study year. The course in the first case was chosen due to the high participation of preservice teachers in it, while the course in the second case was chosen because its instructor got the highest evaluation from the distance learning coordinator of the teacher college regarding his interaction in electronic forums.

Task

The task in the forum of the geometry course was discussing ways to define and introduce geometrical figures to K2 children. This forum was chosen randomly and it was similar to the other three forums in the same course regarding the students' participation. The task in the didactics course was discussing difficulties encountered by preservice teachers when managing online courses and solutions they found to overcome those difficulties. The preservice teachers who participated in the forum were preservice teachers who chose to teach mathematical topics using distance learning platforms. This forum was also chosen randomly and it was similar to the other three forums in the course regarding the participation of the coordinator.

Finding Categories for Analyzing and Evaluating Interaction in Electronic Forums

Finding categories for analyzing and evaluating interaction in electronic forums was done through examining the interaction in the forum of the K2 geometry course. This was done depending on the constant comparison method (Glaser, 1992; Strauss & Corbin, 1998). In constant comparison method, the researcher asks the following question while continually coding, comparing, analyzing, and writing memos about the data being analyzed: "What category or property of a category does this incident indicate?" (Glaser, 1992, p. 19). This was done keeping in mind other analyzing models mentioned above.

Using the Categories to Analyze Feedback in Electronic Forums

The unit of analysis that was used to analyze feedback in electronic forums is the sentence. This was done to guarantee taking into consideration all interaction themes populating the text of a preservice teacher's feedback or the text of the successful distance learning instructor.

Interrater Reliability of the Coding

To ensure interrater reliability of the coding, two coders coded 40% of the feedback given by the five highest and the five lowest participating preservice teachers. The coding decisions of the two coders were evaluated for interrater reliability using Holsti's (1969) coefficient of reliability and Cohen's (1960) Kappa. Holsti coefficient of reliability and Cohen's Kappa were computed for the coding done to arrive at the coding categories of the analyzing tool, the coding done to arrive at the feedback types of the five highest and the five lowest participating preservice teachers, and the coding done to arrive at the interaction types of the successful distance learning instructor.

Holsti coefficients of reliability were found to be 89%, 75% and 77% resoectively, while Cohen's kappa results were found to be 74%, 59% and 64% respectively.

Analyzing the Relations Between the Characteristics of the Exchanges in the Geometry Forum

Five types of characteristics were considered. These characteristics are described in detail below.

Type of Participation

This category has two values: feedback and answer. Feedback is the comment of a participant on the first answer of another participant, while answer is the answer or written reaction on the comment.

Function of Participation

This category has five values: social participation, acceptance participation, notifying participation, requesting participation and giving participation. Detailed description of these categories will be given later in the finding section.

Reference to the Text

This category has four values: Quoting the text, referring verbally to the text but not quoting it, has relation with the text but not referring to it verbally, and not having relation to the text.

Reference to the Author

This category has two values: referring to the author and not referring to the author.

Reference to a Participant Who is not the Author

This category has two values: referring to a participant who is not the author and not referring to a participant who is not the author.

Analyzing Relations Between the Characteristics of the Forum Exchanges

To find if there are significant relations between the previously described characteristics of the forum exchanges chi square test was used. This test is appropriate because it fits the categories of the forum exchanges which are categorical variables.

FINDINGS DESCRIPTION

In this section four issues will be described: an analysis and evaluation too for interactions in electronic forums, feedback types of the highest participating and the lowest participating preservice teachers, correlations between the characteristics of the forum exchanges, and strategies and methods of a successful distance learning instructor in interacting with students.

An Analysis and Evaluation Tool for Interactions in Electronic Forums

The tool suggested in this chapter deals with six categories that involve the function of the interaction: (1) social interaction, (2) acceptance interaction, (3) notifying interaction, (4) requesting interaction, (5) inquiring interaction, and (6) giving interaction. Following is a description of each of the categories of interaction and its subcategories, in addition to examples taken from the K2 preservice teachers' electronic forum.

Categories of the Function of Interaction

- **Social interaction:** In social interaction, participants express thanks or emotional feeling, as in "Many thanks for your feedback" or "I wish you liked the activities that I suggested".
- **Acceptance interaction:**Table 1 describes the sub-categories of the category of the acceptance interaction together with examples.
- **Notifying feedback:**Table 2 describes the sub-categories of the notifying interaction together with examples. What distinguishes the furthering interaction is that it extends an issue included in a participant's post, like directing a participant to consider another aspect of a discussed issue or directing a user to progress from the particular to the general.
- **Requesting interaction:** In requesting interaction, the respondent requires the sender to do an action or to provide something, as in "What is your opinion regarding the use of computers in teaching geometry?" or "You mentioned that there are many methods to introduce children to triangles. Can you please describe for us one or more of these methods?" The types of requesting interaction which were mentioned by the participants in the K2 forum were: requesting action, requesting opinion, requesting solution, requesting an activity description, requesting an experience description, requesting a clarification of an issue, requesting an argument with or against an issue, requesting a fact, and requesting a statement of preference. The requesting interaction is distinguished from the urging interaction in that the urging interaction encourages a participant to work rather than asks him/her directly to do something.
- **Giving interaction:** In giving interaction, the respondent provides the sender with something, for example opinion or a teaching method or an activity, as in "You asked about computers. Well, computers are very important but they need a teacher who knows how to work with them" or "In my class, I do not teach according to one method, but I have different activities to engage the children with at different stages". The types of giving interaction which were mentioned by the participants in the K2 forum were similar to the types that they mentioned in their requesting interaction. The giving interaction is distinguished from informing interaction in that informing interaction does not come as a result from a question or a requirement from a participant, but to send a message to a participant after reading her post to the forum.

Feedback Types of the Highest Participating and the Lowest Participating Students

Table (3) shows the percentage of the feedback types of the highest participating preservice teachers, while table (4) shows the percentage of feedback types of the lowest participating preservice teachers. Both tables distinguish between the first feedback and the answer feedback.

The variance of the feedback types among the preservice teachers within each group was also examined. Table (5) shows the percentages of the types of feedback for every participant in the case of the first feedback, while table (6) shows these percentages in the case of the answer feedback.

Table 1. Sub-categories of the acceptance interaction together with examples

Sub-category	Examples
Agreeing/disagreeing interaction: in agreeing/disagreeing interaction the respondent agrees or disagrees on an issue with the sender.	I agree with you that the computer is an essential tool in this age because of the great potential it has for the student's learning. I do not agree with you regarding the computer's role in the geometry classroom.
'Agreeing/disagreeing with withdrawal' interaction: in agreeing/disagreeing with withdrawal interaction, the respondent agrees or disagrees with the sender on an issue but not on the whole issue, sometimes the respondent puts conditions to agree on the discussed issue.	I agree with you that manipulatives are a good way to learn geometry, but on condition that the teacher or parents keep an eye on the students' activity, so to be able to guide them. I agree with you that it's worth teaching children geometry with the computer but I think teachers should do that not just for the fun and enjoyment of children, but also to make them understand geometry.
Criticizing interaction: In criticizing interaction, the respondent tells the sender that something is wrong with what she wrote.	It's very strange that you have the same points and ideas that we had in our answer; even you have the same sentences. This is very strange since we arrived at those points individually without depending on any source. Why haven't you read the article that the teacher required us to read before answering the questions? If you had read it you wouldn't have had such answers.
Comparing interaction: in comparing interaction, the respondent shares her own experiences or ideas and compares them to those of the sender.	You say that we can teach the angles topic in kindergarten, but from my experience it is so difficult to do so, for we cannot find appropriate activities to do so. You said that we should not teach the rhombus in the primary school, but I saw some K2 teachers teach the rhombus without problems because they fitted the activities to the children' ability.
Supporting interaction: In supporting interaction, the respondent expresses her personal support to the sender for some reason.	Generally I liked how you arranged your answer, for it made everything clear. The activities that you suggested are so distinguishable.
Paraphrasing interaction: In paraphrasing interaction the participant explains the sender's ideas in her own way.	I assume that by different types of triangles you mean triangles which are different regarding their angles, but triangles may be different regarding their edges too. Faten, you mentioned that what distinguishes children is their inability to remember for long time, so I think we should give them activities that remind them of what they learnt.
Alternative claim interaction: In this interaction the respondent introduces a claim different from the one the sender proposed.	Jasmine, you suggested teaching the straight line before the angle. I think that we need to define the angle depending on everyday objects, without defining first the straight line. You stated that it is difficult to teach concepts in this age, but this age possesses the means to understand concepts, so I think it's possible to teach concepts if we succeed to use appropriate activities to do that.

Correlations Between the Characteristics of the Forum Exchanges

Correlations Between the Type of Participation and Other Characteristics of the Forum Exchanges

Using the chi square test, it was found that the type of participation has significant correlations with each of the other characteristics of the forum exchanges. Table 6 describes these correlations.

In addition, the crosstab tables (which show the actual and the expected frequency of the values of the research variables) show that the strong significant correlation between the type of participation and the feedback function is due to the fact that the 'giving feedback' was given almost solely in the 'answer' feedback type (the 'giving feedback' is greater far more than expected in the 'answer feedback' and smaller far less than

Table 2. Sub-categories of the notifying interaction together with examples

Sub-category	Examples
Informing interaction: In informing interaction, the respondent tells the sender that the post was read and/or points out that an issue needs more study or verification or is not based on practice or theoretical material.	• I read every sentence in your answer. • I want to point to the teacher that some activities mentioned by Hiyam are appropriate to the second grade and not to the kindergarten.
Giving credit interaction: In 'giving credit' interaction, the respondent tells the sender that an opinion of the sender benefited the respondent or influenced her views or provided her with what she needed, etc.	• The rectangle activity that you suggested benefited me greatly. • You have given me fruitful thoughts that answer some questions I have been thinking about for a long time.
Redirecting interaction: In redirecting interaction, the respondent tries to influence the progression of the discussion.	• Amira asked you how to work with computers in the geometry lessons, but I think the basic issue should discuss why to work with computers in geometry lessons. • You described activities suitable for teaching the quadrilateral topic, but I think we should first discuss if we need to teach the quadrilateral in the K2 classrooms.
Furthering interaction: In furthering interaction, the respondent tries to progress with the issue that was discussed by a participant.	• You mentioned the main problem that teachers encounter when teaching geometry to first grade children. I think we should now think about the problem solutions, which help in succeeding to teach geometry to first grade children. • You described one activity that can be used to teach the rectangle topic. Now we should think about activities suitable for teaching every quadrilateral.
Urging interaction: In urging interaction, the respondent encourages the sender to do something, for example to comment on her feedback.	• Waiting for your answer. • I hope you will comment on my feedback.

expected in the 'comment feedback'), while the 'requesting feedback' was given solely in the 'comment feedback' . Further, 'social feedback' was given in the 'answer feedback' far more than in the 'comment feedback' (more than expected in the 'answer feedback' and less than expected in the 'comment feedback').

The crosstab tables also show that the strong significant correlation between the type of participation and the reference to the text is due to the fact that 'quoting' and 'no reference to the text' were present more in the feedback from the type 'comment' (more than expected in this type of feedback and less than expected in the 'answer feedback'), while reference to the text was used more in the 'answer feedback' (far more than expected in this type of feedback and less than expected in the 'comment feedback') .

The strong significant correlation between the 'type of participation' and 'the reference to the participant who is not the author' is due to the fact that 'reference to participant who is not the author' was present more in the feedback from the type 'comment' (more than expected in this type of feedback and less than expected in the 'answer feedback').

Correlations Between the Feedback Function and Other Characteristics of the Forum Exchanges

Using the chi square test, it was found that the feedback function has significant correlations with each of the other characteristics of the forum exchanges. Table 7 describes these correlations.

In addition, the crosstab tables show that the strong significant correlation between the feedback function and the 'reference to the text' is due to the fact that when the feedback function was social, reference to the text or no reference at all were present more than expected, while in the acceptance and giving feedback, what surpassed

Table 3. percentage of the feedback types of the highest participating preservice teachers

Type of Feedback	Percent	
	First feedback N=322	Answer feedback N=207
Social feedback	6.52%	29.95%
Acceptance feedback	**9.94%**	**9.18%**
Agreeing/disagreeing feedback	0.31%	5.8%
Agreeing/disagreeing with withdrawal' feedback	—	0.48%
Criticizing feedback	2.17%	1.93%
Comparing feedback	1.86%	0.48%
Supporting feedback	5.28%	—
Paraphrasing feedback	0.31%	—
Alternative claim feedback	—	0.48%
Notifying feedback	**13.66%**	**6.28%**
Informing feedback	4.97%	5.8%
Giving credit feedback	3.73%	0.48%
Redirecting feedback	0.31%	—
Furthering feedback	4.66%	—
Urging feedback	—	—
Requesting feedback	**69.25%**	**0.48%**
Action	2.48%	0.48%
Opinion	28.26%	—
Solution	9%	—
Activity	2.17%	—
Experience	6.21%	—
Clarifying	17.39%	—
Argument	1.86%	—
Fact	—	—
Preference	1.86%	—
Giving feedback	0.62%	54.11%
Action	—	—
Opinion	0.31%	25.6%
Solution	—	1.93%
Activity	—	1.45%
Experience	—	9.18%
clarifying	—	10.14%
Argument	—	2.42%
Fact	—	1.93%
preference	0.31%	1.45%

Table 4. percentages of the feedback types of the lowest participating preservice teachers

Type of Feedback	Percent	
	First feedback N=25	Answer feedback N=79
Social feedback	4%	22.78%
Acceptance feedback	**16%**	**15.19%**
Agreeing/disagreeing feedback	8%	11.39%
Agreeing/disagreeing with withdrawal' feedback	—	—
Criticizing feedback	4%	1.27%
Comparing feedback	4%	1.27%
Supporting feedback	—	—
Paraphrasing feedback	—	1.27%
Alternative claim feedback	—	—
Notifying feedback	8%	10.13%
Informing feedback	4%	3.79%
Giving credit feedback	4%	5.06%
Redirecting feedback	—	1.27%
Furthering feedback	—	—
Urging feedback	—	—
Requesting feedback	**72%**	**1.27%**
Action	4%	1.27%
Opinion	44%	—
Solution	—	—
Activity	—	—
Experience	4%	—
clarifying	20%	—
Argument	—	—
Fact	—	—
Preference	—	—
Giving feedback	—	**50.63%**
Action	—	—
Opinion	—	25.32%
Solution	—	6.33%
Activity	—	2.53%
Experience	—	2.53%
clarifying	—	11.39%
Argument	—	1.27%
Fact	—	1.27%
Preference	—	—

Table 5. The percentage of the feedback types for every participant in the case of the first feedback

Participants	Social feedback	Acceptance feedback	Notifying feedback	Requesting feedback	Giving feedback
The highest participating preservice teachers					
First Participant	5.45%	22.73%	11.82%	60%	0%
Second Participant	6.38%	3.19%	18.09%	72.34%	0%
Third Participant	16.36%	5.45%	12.73%	63.64%	1.82%
Fourth Participant	0%	0%	16.67%	83.33%	0%
Fifth Participant	0%	2.38%	7.14%	88.09%	2.38%
The lowest participating preservice teachers					
First Participant	0%	0%	0%	100%	0%
Second Participant	0%	20%	20%	60%	0%
Third Participant	14.29%	28.57%	0%	57.15%	0%
Fourth Participant	0%	0%	0%	100%	0%
Fifth Participant	0%	16.67%	16.67%	66.67%	0%

Table 6. The percentage of the feedback types for every participant in the case of the answer feedback

Participants	Social feedback	Acceptance feedback	Notifying feedback	Requesting feedback	Giving feedback
The highest participating preservice teachers					
First Participant	39.56	6.59	1.1	1.1	51.65
Second Participant	30.77	12.82	7.69	0	48.72
Third Participant	22.5	7.5	12.5	0	57.5
Fourth Participant	9.09	18.18	0	0	72.73
Fifth Participant	15.38	11.54	15.38	0	57.69
The lowest participating preservice teachers					
First Participant	33.33	0	8.33	8.33	50
Second Participant	0	9.09	0	0	90.91
Third Participant	50	12.5	0	0	37.5
Fourth Participant	20.83	12.5	29.17	0	37.5
Fifth Participant	20	32	0	0	48

Table 7. Correlation of the type of participation with the other characteristics of the forum exchanges

	Feedback function	Reference to the text	Reference to the author	Reference to a participant who is not the author
χ^2 p	41.999 0.000	171.030 0.000	20.549 0.000	141.001 0.000
df	4	3	1	1
Cramer's V p	0.796 0.000	0.513 0.000	0.178 0.000	0.466 0.000

Table 8. correlation of the feedback function with the other characteristics of the forum exchanges

	Type of participation	Reference to the text	Reference to the author	Reference to a participant who is not the author
χ2 p	411.599 0.000	411.91 0.000	65.645 0.000	151.702 0/000
df	0	12	4	4
Cramer's V p	0.796 0.000	0.460 0/000	0.318 0.000	0.318 0.000

the expected is only the reference to the text. In the notifying feedback, what surpassed the expected is only the relation to the text.

Correlations Between the Reference to the Author and Other Characteristics

Using the chi square test, it was found that there is a significant correlation between 'the reference to the author' and 'the reference to the text' with χ2=46.401, df=3, p=0.000. The previous correlation is medium, with significant Cramer's V=0.267. No significant correlation was found between 'the reference to the author' and 'the reference to a participant who is not the author'.

Correlation Between the Reference to the Text and the Reference to a Participant Who is Not the Author

Using the chi square test, it was found that there is a significant correlation between 'the reference to the text' and 'the reference to a participant who is not the author', with χ2=73.208, df=3, p=0.000. The previous correlation is medium, with significant Cramer's V=0.336.

Strategies and Methods of a Successful Distance Learning Instructor in Interacting with Students

The described analysis and evaluation too was used to analyze the interactions of a successful distance learning instructor in an electronic forum, where the preservice teachers, together with the instructor, discussed the difficulties they encountered in managing, for the first time, distance learning courses.

Following are some interaction strategies followed by the instructor in interacting with the preservice teachers on the described issue.

Requesting Action Interaction

One preservice teacher said that she had difficulties managing the distance learning course and promised to describe these difficulties at the weekend. The instructor requested the preservice teacher to describe the difficulties as soon as possible, so that she could describe the difficulties exactly, discuss them and start dealing with them.

Furthering Interaction

One preservice teacher described the first difficulty she encountered at the beginning of her teaching distance learning courses: "in spite of the fact that I showed the students how to participate in the distance learning platform, it was difficult for them

to participate in a forum or send an assignment." The instructor tried to further the issue, asking the preservice teacher to think about how she might overcome this difficulty. The preservice teacher responded saying that a social forum may encourage the students to participate and thus get used to writing and interacting in an electronic forum. In addition, the preservice teacher suggested opening another forum for the questions of the students, so if they encounter difficulties they can inquire about them in the forum.

Another furthering interaction happened when a preservice teacher reported that she found difficulty teaching mathematical topics using the messenger. The instructor urged the preservice teacher to think why it was difficult for her to use the messenger for teaching mathematics. The preservice teacher responded saying that two causes could be possible: (1) the messenger is not a suitable tool for teaching mathematics (2) it is the first experience of the students in learning mathematics with the messenger. The instructor furthered the discussion: "what about your experience?" The preservice teacher agreed that her experience in teaching mathematics with the messenger is also new, and declared she would think about the matter again.

Requiring Clarification

One preservice teacher wrote that it is difficult for her and for the students to agree on a time in which they meet in the messenger in order to hold the weekly synchronous lessons. The instructor required the preservice teacher to clarify why they cannot find dates that suit them both. The preservice teacher explained that she was usually free in the morning, while the students were free in the evening. Other preservice teachers agreed that this was their problem too. They agreed that they should try more to find dates that suit both them and the students.

Urging Interaction

One preservice teacher claimed that the age of the students could be the reason why the pace of her teaching is slow. The instructor urged the preservice teacher to try to speed the pace of her teaching so she would succeed to cover most of the learning material. The preservice teacher promised to try. She reported after two weeks that she succeeded to speed the pace of her teaching by contacting the students by e-mail, by the messenger and by the telephone, and urging them to learn more at home. In addition, she frequently inquires about what they might have not understood in the electronic forum.

Requesting Information and Redirecting

One preservice teacher described in detail the difficulty to register the students to the distance learning platform. The lecturer asked her about the number of students that succeeded to register to the platform. The preservice teacher answered that ten students had already registered, but five still did not succeed. The instructor directed the preservice teacher to think about a way that ensures the registration of the rest of the students. The preservice teacher replied that she will communicate with them to settle the matter.

Suggesting Actions

One preservice teacher reported that the disconnections in the internet slowed the pace of her teaching and asked for advice regarding what she could do to speed the pace. The instructor advised her to come to the college on her free days and work in the computer lab. Another preservice teacher suggested that she should get help from a classmate who also taught distance learning courses, and, when needed, she could help that classmate in teaching her teaching.

Accepting with Withdrawal

One preservice teacher reported that she had to go to the students' school every week, at least for an hour, to encourage them to increase their participation in the distance learning course. The instructor noted that the visit to the school may encourage the students to participate in the distance learning course but, at the same time, it may turn the course from distance learning course to a blended learning course. The instructor suggested that the preservice teacher think about the type of course she wants to teach. The preservice teacher replied, saying she was not sure she wanted to teach a blended learning course, and added that she might turn to using the e-mail for encouraging the students to participate in the distance learning course.

DISCUSSION

Feedback Types of the Highest Participating and the Lowest Participating Students

In the first case study, the percentages of the feedback types of the five highest participating preservice teachers and the five lowest participating preservice teachers were calculated. It was found that the preservice teachers in both groups included more social elements in their answer feedback than in their first feedback (table (3) and (4)). This happened because the participants in both groups thanked some of those who gave them a comment feedback (in the frame of first feedback), but generally did not thank those who submitted their answers regarding the issue which the forum raises (as their first contribution to the forum), as if giving a first contribution is a minimal requirement of participating in a forum, so it does not require thanking.

The two groups had a similar percentage of acceptance feedback in their first and answer feedback (table (3) and (4)), but there is difference between the attitudes of the two groups concern-

ing the notifying elements that they included in their posts (table (3) and (4)), where the highest participating preservice teachers included more notifying elements in their first feedback than the lowest participating preservice teachers, though they had similar percentages of informing elements in their comment feedback. This happened because some of the highest participating preservice teachers included furthering elements, while the lowest participating preservice teachers did not include such elements. This probably happened because some of the highest participating preservice teachers have the characteristic of proceeding classroom discussions or group learning, or they looked for ways to participate in the forum discussions and found furthering feedback as one of the ways to do so.

Looking at the percentages of the subcategories of the requesting feedback (table (3) and (4)), it can be seen that the feedback types of the highest participating preservice teachers vary more than the feedback types of the lowest participating preservice teachers. This points that the highest participating preservice teachers are concerned generally with more interaction aspects than the lowest participating preservice teachers. This concern could be related with the personal characteristics of the participants who, as mentioned above, search for various ways to show active participation.

Both groups of the participants are similar regarding the percentage of the requesting and giving feedback that they included in their posts (table (3) and (4)), though individually there is difference among the participants of each group regarding these percentages (table (5) and (6)). The similar percentage of the requesting and giving feedback is due to the tendency of including a request feedback in the feedback of the comment type, while including a giving feedback in the feedback of the answer type. Further, the difference among the participants of each group regarding the percentages of contributed request and giving feedback is due to the influence of personal characteristics on the percentage of the overall contribution of

the participants, and in particular the percentage of request and giving feedback. This influence of personal characteristics on learners' behavior is described by Tella (2007) who found that highly motivated students perform better academically than the lowly motivated students. The previous explanation is supported by Halawah (2006) who found that personal characteristics of students and their motivation are highly correlated. This implies that personal characteristics and academic achievement can be highly correlated too due to the influence of motivation on academic achievement (Kim, Kim & Hong, 2007).

Looking at the percentages of the sub-categories of the giving feedback (table (3) and (4)) it can be seen that the participants of both groups included varied sub-categories of this type of feedback and were not content with one or two sub-categories.

So, generally speaking, it can be said that the highest participating preservice teachers included feedback of various functions, in both the comment and the answer types of feedback, far more than did the lowest participating preservice teachers. Second, the highest participating preservice teachers included furthering feedback in their posts while the lowest participating preservice teachers did not. Third, the feedback of the participants in both groups is similar regarding the variation of the sub-categories of the giving feedback that they included; i.e. they used different types of the giving feedback. Fourth, both groups of participants are similar regarding the percentages of the request feedback and giving feedback from the overall feedback, but they differ individually within each group.

Relations Between the Characteristics of the Forum Exchanges

Using the chi square test, it was found that the type of participation had significant correlations with each of the other characteristics of the forum exchanges. This could be related to the preservice teachers' different perception of the comment feedback and answer feedback, for example they may have looked at the comment feedback as a feedback on others' contributions, but have looked at the answer feedback as involving defending their own contribution or at least involving an issue that could be related to their own contribution. Another reason for this difference could be due to the preservice teachers' perception of the comment feedback as a stage in which they should ask questions, while they perceived the answer feedback as a stage in which they should answer questions. This explanation is supported by researches which point at the influence of perception on behavior (Rummel, 1976; Chanal et al., 2009).

Using the chi square test, it was also found that the feedback function had significant correlations with each of the other characteristics of the forum exchanges. This also could be explained by the perception of students regarding their behavior when giving feedback that has a specific function. It seems, for example, that they perceived the requesting feedback and the social feedback as ones which do not need referring to the author, while they perceived the giving feedback, the notifying feedback and the acceptance feedback as ones which need referring to the author. The reason of the previously mentioned perceptions could be cultural or linked to a specific situation, for example, some preservice teachers, when they thanked they mentioned a specific reason for their thanking, as when saying: "thank you because you deepened my knowledge about how to teach triangles to children". This thanking is due to the discussion conditions, where the instructor required the preservice teachers to give a reason for every statement they write.

Strategies and Methods of a Successful Distance Learning Instructor's Interactions

The instructor used various types of interaction. Every type was caused by a different educational situation and resulted in a specific change in the educational situation. For example, the instructor performed a requesting interaction to encourage the preservice teachers to do or not do specific actions. Generally, a requesting interaction was followed by the preservice teachers performing the instructor's requesting.

Generally a 'furthering interaction' happened in a situation where there was a place for further discussion, action or interaction. For example, the instructor furthered the issue of the students' difficulty to participate in the distance learning platform and asked the preservice teacher to think about how she might overcome this difficulty. This resulted in further interaction and then action which consisted of opening two forums to overcome the difficulty.

Usually a 'requiring clarification' interaction came due to a situation where there prevails some ambiguity regarding at least one aspect of the situation described by a preservice teacher.

An 'urging interaction' generally happened when the situation needed immediate action, and it generally resulted in action.

Generally speaking, the instructor used different types of interaction that depended on the specific situation lived or described by a preservice teacher. Overall, the interaction phenomenon of the successful distance learning instructor in the electronic forum can be described by Figure 1.

Luca, Cowan and McLoughlin (2004) proposed the electronic forum as a tool which enriches the construction of a learning community and, at the same time, increases the flexibility of learning. The instructor's interactions described above increased the flexibility of learning of the preservice teachers and moved it forward, and

Figure 1. An interaction model of a successful distance learning instructor
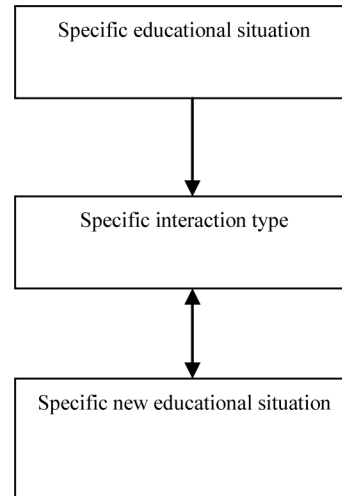
thus helped these preservice teachers become better distance learning teachers.

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

The highest participating and the lowest participating groups of participants were different regarding the use of some types of feedback and similar regarding the use of other types. It is recommended to examine the difference between high and low participating students' types of feedback in different online courses. Doing so, it can be examined if the same patterns reported in this research exist in other populations and forums. It is also recommended to examine if the patterns have relation to the participants' individual characteristics. Also, why some participants are more active than others? Is it the technology, the instructor, the sense of being comfortable with others in the class, etc.?

Different significant correlations were found between the different characteristics of the forum exchanges. These differences were due primarily to the participants' perceptions of the properties of the feedback types and functions. This implies

that if we want to influence the characteristics of the forum exchanges we should work first on the participants' perceptions of exchanges. For example we should emphasize the importance of referring to the author in order to involve her more in the discussion.

The instructor used different types of interaction that depended on the specific situation lived or described by the participants. This shows the importance of the situation and that distance learning instructors should vary their instruction according to it.

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KEY TERMS AND DEFINITIONS

Answer Feedback: The answer feedback is the participant's response on the comment feedback given on her first contribution.

Chi-Square Test: The chi-square test is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories.

Comment Feedback: The comment feedback is the first feedback that the forum participant gives on the first contribution of other participants. Here we should differentiate between the first feedback and the first contribution, where the first contribution is the text the participant writes as a response to the instructor's question or suggested discussion regarding an educational issue related to the subject of the course, while the first feedback is the participant's comment on the first contribution.

Course Instructor: A teacher or a lecturer who facilitates the learning of students in a course; an online course for the purpose of this article.

Crosstab Table: The crosstab table shows the actual and the expected frequency of the values of the research variables.

Function of Participation: The function of participation could be: social, acceptance, notifying, requesting and giving.

Type of Participation: Type of participation could be feedback or answer. Feedback is the comment of a participant on the first contribution of another participant, while answer is the answer or written reaction on the comment.

Virtual Interactions: Interactions that occur in the electronic forums which are part of the online course.