So Far But Yet So Close: Student Chat Room Immediacy, Learning, and Performance in an Online Course

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Immediacy behaviors enhance perceptions of closeness to others. In traditional and online college courses, instructor immediacy predicts student reports of learning and motivation. Student immediacy is theoretically also important in any learning community. However, there is little research on cyber-student immediacy as a predictor of course outcomes, and studies to date have focused on asynchronous, rather than synchronous, class communications. We rated 14 immediacy indicators in synchronous chat responses, with moderate to high reliability. Student immediacy was not related to examination performance, but the immediacy behavior of support was positively correlated with changes in pre- to post-course test scores. We discuss implications for measuring online immediacy, and for designing online learning communities.

Immediacy is defined as behavior that enhances perceptions of closeness to others (Andersen, 1979; Wiener & Mehrabian, 1968). Nonverbal immediacy behaviors include eye contact, touch, relaxed posture, and smiling.

Immediacy has been studied extensively in traditional college classrooms. Most investigators have used student reports (e.g., Frymier & Thompson, 1995; Robinson & Richmond, 1995) to measure both instructor immediacy and criterion variables such as motivation, learning, attitude toward course content, and course satisfaction (Andersen, 1979; Christensen & Menzel, 1998; Frymier, 1994; Gorham, 1988; Moore, Masterson, Christophel, & Shea, 1996; Richmond, Gorham, & McCroskey, 1987). These studies indicate that instructor immediacy has a positive impact on the educational experience – at least as measured by students’ subjective impressions. However, in two separate investigations, Andersen and colleagues (1979; Andersen, Norton, & Nussbaum, 1981) did not find a relationship between perceived teacher immediacy and actual course performance.

Recently, attention has turned to the role of immediacy, or social presence, in creating effective online learning communities (Garrison, Anderson, & Archer, 2001; LaRose & Whitten, 2000; Picciano, 2002; Swan, 2002). Social presence and immediacy are virtually identical constructs, each referring to perceived salience or closeness of the other in social interactions (Rourke, Anderson, Garrison, & Archer, 2001). Garrison et al. (2001) proposed a model in which social presence, along with cognitive and teaching presence, is a core component of learning in the online “community of inquiry.” The potential for assessing text communications that enhance verbal immediacy, or social presence, is expanded by online course technology, which records all synchronous and asynchronous communication among class members. In such classrooms, achievement of educational goals would theoretically involve immediacy behaviors of co-learners and instructors, and immediacy could be an intraindividual or situational variable (Picciano, 2002).

At least three studies have shown that verbal immediacy is associated with positive outcomes in online college courses,1 as least as far as student perceptions are concerned. Arbaugh (2001) surveyed students in 25 web-based MBA courses, using Gorham’s (1988) verbal immediacy scale, and found that greater verbal immediacy on the part of the instructor, as reported by students, predicted greater course satisfaction and perceived learning. Baker (2004) used the same scale in a study of 145 graduate students enrolled in online courses, and found that students who rated their instructors as more verbally immediate reported more positive affect toward the course content, and greater perceived learning. Picciano (2002) used a measure of general class “presence,” and found that student ratings of the quality of course interaction were related to perceptions of learning and to scores on written assignments, but not to test scores.

Rourke et al. (2001) and Swan (2002) performed content analyses of
cyber-students’ asynchronous communications, and used affective, interactive, and cohesive immediacy indicators to describe patterns in student interaction. However, neither of their studies included assessment of student immediacy as an intrindividual correlate of learning outcomes. Nor did they assess immediacy in synchronous chat discussions, which may be more spontaneous, and thus more motivational, than asynchronous discussions (Newlin & Wang, 2002). Evidence for chat communication as a predictor of online class performance is provided by Wang, Newlin, and Tucker (2001), who performed a discourse analysis of chat in an online statistics class. Although they did not assess immediacy, they found that frequency and certain forms of chat interaction predicted final grades.

Picciano (2002) concluded that there is sufficient evidence that qualities of online interaction affect perceptions of learning, but cautioned that perceptions are not equivalent to actual achievement. He recommended that “multiple measures related to individual academic program and course objectives be used” (Picciano, 2002, p. 25) to examine the role of online interaction variables in course outcomes. Picciano (2002) also emphasized that interaction and social presence are not the same constructs, and may affect learning independently: “it is possible for a student to interact by posting a message…while not necessarily feeling that he/she is part of a group or class” (p. 22).

In this exploratory study, we assessed student immediacy and learning outcomes with objective measures, rather than via self-report, and measured immediacy and the broader construct of participation in online chat sessions. We developed a protocol to code student immediacy behaviors in synchronous chat room discussions. The protocol was based on those created by Rourke et al. (2001) and Swan (2002), as well as on our own analysis of chat transcripts from two sections of an online introductory psychology course. We addressed five questions:

1) Can student chat room immediacy behaviors be reliably coded and quantified from text responses in synchronous chat room discussions?

2) How do students vary in chat room immediacy behaviors, and in overall chat room participation?

3) What is the relationship between student chat room immediacy and class performance?

4) What is the relationship between student chat room immediacy and learning?

5) Do student chat room immediacy and participation independently contribute to performance and learning?
METHOD

Students & Course Characteristics

We collected data from 26 students enrolled in two sections of an online introductory psychology class, taught by author Langley Frissell at a community college in Honolulu, Hawai‘i. Students consented to use of their data, and completed an online questionnaire eliciting demographic information. The participants included 9 freshmen, 8 sophomores, and 4 seniors at other colleges (5 did not provide data on class standing). Twenty were women and 6 were men; their ages ranged from 18 to 42 ($M = 25.58$, $SD = 6.74$). Seventeen were employed full or part-time. Eleven were Asian American, 5 were Hawaiian or Part-Hawaiian, 5 were Caucasian, and 5 were of mixed ethnicity. Eight had previous online course experience.

Web Course Tools (WebCT; 1998) provided the environment in which students communicated with class members and accessed lessons, activities, assignments, and tests. Asynchronous communication occurred via private mail and/or the WebCT Bulletin Board; synchronous communication occurred in chat sessions. Each week included a lesson, a chat session (except during examination weeks), and a bulletin board posting on an assigned topic or an examination. Lesson text, images, and audio narration were created with Microsoft PowerPoint (1997), and then published and uploaded to a university server using RealPresenter (1998) software.

The instructor held twelve chat sessions, structured around assigned topics. Students and instructor participated by typing responses. His voice was audible to students via the RealProducer live broadcast function, although he could not hear them, nor could they hear each other.

Students’ grades were based on four non-cumulative, 30 item multiple-choice examinations (55% of final grade), bulletin board postings (20%), a research paper (20%), and chat participation (5%). Students earned extra credit points for completing cumulative pre- and post-course tests (described below).

Measures

We measured student performance with average scores from the four examinations, and assessed student learning via differences between pre- and post-course scores on a 100 item multiple-choice test (pre-test subtracted from the post-test). During the first week of class, the instructor administered the pretest, which included all topics in psychology covered in the course. He administered the same items in a post-test the last week of class. Items from the pre- and post-tests did not appear on the four graded examinations.

We assessed chat participation via number of chat sessions attended, and the average number of text responses across sampled chat sessions. A “response” was the text that was typed before a student hit the return key to post remarks; thus one response could consist of one or multiple sentences or phrases.
Our measure of immediacy was based on the coding protocols of Rourke et al. (2001) and Swan (2002), which distinguish among affective, interactive, and cohesive indicators (see Table 1). A single response may be coded for multiple indicators, although some categories are mutually exclusive. Affective indicators involve expressions of emotion and value, and include self-disclosure. Cohesive indicators are behaviors that contribute to group commitment or sense of community. Interactive indicators are behaviors that sustain meaningful communication. We coded each response for the presence or absence of indicators (e.g., a response with one or multiple instances of Emotion was scored 1 for that indicator).

To develop the protocol, we selected chat transcripts from the classes, and used the indicators identified by Rourke et al. (2001) and Swan (2002) to code students’ responses. We coded protocols independently, and then compared decisions. This led to the exclusion or recombination of some indicators, and the emergence of two more: support and self-disclosure in response to course material. Final operational definitions’ for each immediacy indicator are shown in Table 1.

Coding & Scoring Procedures

After finalizing operational definitions, we trained a third coder, and two of three coders independently scored chat responses from each student. To guard against observer drift and maintain reliability and validity, we used a procedure developed by DeMaster, Reid, and Twentyman (1977), whereby coders are provided with regular feedback on intrarater agreement and adherence to criteria. For final scores, we resolved discrepancies through consensus.

In order to sample students’ chat behaviors over the duration of the course, we scored transcripts (logs) from three sessions: one from Weeks 1-2, one from Weeks 8-9, and one from the final 2 weeks of the 16-week course. From each log, we derived frequency scores for each indicator, as well as for non-immediacy responses (those containing no immediacy elements) and total chat responses. We summed across indicators to create scores for total immediacy, and for total non-immediacy. We then calculated average scores across the three sampled logs. These raw average scores were skewed by variability in frequency of chat responses per chat log (ranging from 1 to 106); to correct for this, we divided average scores for each immediacy indicator and for non-immediacy, which were coded only once per response, by the average total chat responses across logs (cf. Rourke et al., 2001). For total average immediacy, where coding of multiple indicators per response led to raw frequency scores exceeding average response total, we divided by the sum of the average total immediacy and non-immediacy responses.
<table>
<thead>
<tr>
<th>Score</th>
<th>Definition</th>
<th>Examples</th>
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<tr>
<td>Paralanguage</td>
<td><em>Affective Immediacy Indicators</em> Percent of responses with text features outside conventional syntax, used to convey emotion or nonverbal behaviors.</td>
<td>Emoticons, exaggerated punctuation or spelling: 😊; lo; …WHAT?!; nooo way!</td>
</tr>
<tr>
<td>Emotion</td>
<td>Percent of responses with emotional expression (type or intensity) using conventional syntax.</td>
<td>I’m so disappointed; That’s a bummer! That makes me so angry…</td>
</tr>
<tr>
<td>Humor</td>
<td>Percent of responses including jokes, teasing, irony, puns, sarcasm, or cajoling.</td>
<td>Praise be… I CAN HEAR! Just kidding – can hear you fine. Prof</td>
</tr>
<tr>
<td>Self-Disclosure</td>
<td>Percent of responses with personal information or details of life outside class, or expressing personal vulnerability.</td>
<td>I find balancing school &amp; family so stressful; I’m a computer illiterate</td>
</tr>
<tr>
<td>Self-Disclosure in Response to Course Material</td>
<td>Percent of responses providing personal information and life details in response to course topic.</td>
<td>The treatment for alcohol abuse we read about worked for me</td>
</tr>
<tr>
<td>Value Statement</td>
<td>Percent of responses with expository statements of personal values, opinions, or beliefs.</td>
<td>Education should be the state’s first priority; that’s important Information.</td>
</tr>
<tr>
<td>Invitation</td>
<td><em>Interactive Immediacy Indicators</em> Percent of responses involving questions or other ways of eliciting verbal or behavioral responses.</td>
<td>What do you folks think?; I have a question; imagine depression would be like</td>
</tr>
<tr>
<td>Approval &amp; Appreciation</td>
<td>Percent of responses including praise, compliments, or expressions of appreciation or gratitude more intense than simple polite behaviors.</td>
<td>Thanks for sharing that with us; Great job!; the video really helped</td>
</tr>
<tr>
<td>Support</td>
<td>Percent of responses involving support, empathy, encouragement, specific advice, helpful inquiries clarifications, or suggestions.</td>
<td>Email me if you need more help; let’s get back on topic; I had the same experience;</td>
</tr>
<tr>
<td>Agreement &amp; Dis-agreement</td>
<td>Percent of responses containing explicit agreement or disagreement with others’ remarks.</td>
<td>I totally agree; I don’t think that’s true</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>Percent of responses with facilitative references or rejoinders to others’ remarks, or clarification, restatement, or expansion of others’ remarks.</td>
<td>Oh, I see; I got it; OK; yes – ready to start; what you said before was clear</td>
</tr>
</tbody>
</table>
RESULTS

Table 2 shows mean scores for immediacy and participation scores, coder agreement (kappa coefficients) for each immediacy indicator, correlations between chat room behaviors and performance, and correlations between chat room behaviors and learning. We coded 2,147 chat responses from 17 chat logs for the presence of 14 immediacy indicators, as well as for non-immediacy. Kappa coefficients for each immediacy indicator ranged from .69 to .96 (nearly 100% agreement). The alpha coefficient (internal consistency) for total average immediacy was .61, a level to be expected for a variable composed of theoretically related but heterogeneous items.3

Table 2 shows mean scores, expressed as percent of average chat participation, for immediacy indicators across chat sessions, as well as score ranges. Average chat response frequency ranged from 8 per session to nearly 71. Standard deviations for scores on 8 of the 14 individual immediacy indicators were equal to or exceeded mean scores. All students engaged in Acknowledgement and Salutations & Phatics at least once in the sampled chat logs, and 96% engaged in Invitation at least once. Group Reference was shown one or more times by 85% of the students, while Paralanguage, Vocatives, and Agreement/Disagreement were shown one or more times by 81%. Approval was shown at least once by 69% of the students. In contrast, Humor, Self-Disclosure, Value Statements, and Support were shown one or more times by only 62% of the students. Finally, just over half the students (54%) engaged in Emotion and Self-Disclosure at least once.

Table 2 shows Pearson product moment correlations between immediacy behaviors and class performance, as well as between class performance and the participation indices of chat attendance and average total chat participation. These correlations were not significant. This was probably not due to restricted range in average examination scores, as these ranged from 13.25 to 28.75 (\(M = 23.5, SD = 3.53\)). There was variability in immediacy indicators and composite scores, but perhaps the skewed distributions of some
<table>
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<tr>
<th>Chat room behaviors</th>
<th>Reliability (Kappa or Alpha)</th>
<th>Correlation with Performance (N = 26)</th>
<th>Correlation with Learning (N = 22)</th>
<th>Score means &amp; range across 3 chat logs (N = 26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paralanguage</td>
<td>K = .96</td>
<td>.19</td>
<td>.17</td>
<td>M = .11 (SD = .10) .00 – .37</td>
</tr>
<tr>
<td>Emotion</td>
<td>K = .71</td>
<td>.21</td>
<td>.21</td>
<td>M = .01 (SD = .01) .00 – .05</td>
</tr>
<tr>
<td>Humor</td>
<td>K = .83</td>
<td>-.11</td>
<td>.31</td>
<td>M = .04 (SD = .04) .00 – .16</td>
</tr>
<tr>
<td>Self-Disclosure</td>
<td>K = .78</td>
<td>.18</td>
<td>.19</td>
<td>M = .03 (SD = .04) .00 – .19</td>
</tr>
<tr>
<td>Self-Disclosure in Response to Material</td>
<td>K = .77</td>
<td>-.05</td>
<td>.19</td>
<td>M = .03 (SD = .04) .00 – .15</td>
</tr>
<tr>
<td>Value Statements</td>
<td>K = .83</td>
<td>.14</td>
<td>.04</td>
<td>M = .02 (SD = .03) .00 – .10</td>
</tr>
<tr>
<td>Invitation</td>
<td>K = .94</td>
<td>.17</td>
<td>-.01</td>
<td>M = .22 (SD = .08) .00 – .36</td>
</tr>
<tr>
<td>Approval &amp; Appreciation</td>
<td>K = .79</td>
<td>.09</td>
<td>.35</td>
<td>M = .02 (SD = .02) .00 – .08</td>
</tr>
<tr>
<td>Support</td>
<td>K = .69</td>
<td>.09</td>
<td>.54**</td>
<td>M = .03 (SD = .03) .00 – .10</td>
</tr>
<tr>
<td>Agreement &amp; Disagreement</td>
<td>K = .84</td>
<td>.23</td>
<td>.37*</td>
<td>M = .04 (SD = .03) .00 – .09</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>K = .79</td>
<td>.03</td>
<td>-.07</td>
<td>M = .41 (SD = .13) .16 – .60</td>
</tr>
<tr>
<td>Salutations &amp; Phatics</td>
<td>K = .96</td>
<td>.22</td>
<td>-.23</td>
<td>M = .14 (SD = .06) .05 – .28</td>
</tr>
<tr>
<td>Vocatives</td>
<td>K = .96</td>
<td>.11</td>
<td>.28</td>
<td>M = .05 (SD = .05) .00 – .21</td>
</tr>
<tr>
<td>Group Reference</td>
<td>___ = .81</td>
<td>-.04</td>
<td>-.23</td>
<td>M = .03 (SD = .03) .00 – .11</td>
</tr>
<tr>
<td>Average Total Immediacy</td>
<td>___ = .61</td>
<td>.21</td>
<td>.01</td>
<td>M = .82 (SD = .12) .57 – .95</td>
</tr>
<tr>
<td>Average Total Non-Immediacy</td>
<td>K = .89</td>
<td>-.22</td>
<td>.02</td>
<td>M = .24 (SD = .14) .10 – .54</td>
</tr>
<tr>
<td>Chat Attendance</td>
<td>___</td>
<td>-.07</td>
<td>.10</td>
<td>M = 8.5 (SD = 2.00) 3.00 – 12.00</td>
</tr>
<tr>
<td>Average Total Chat Participation</td>
<td>___</td>
<td>-.07</td>
<td>.40*</td>
<td>M = 27.58 (SD = 18.29) 8.00 – 70.67</td>
</tr>
</tbody>
</table>

**Note:** *p < .10. **p < .01.
(i.e., frequent mean scores of 0.0 or 1.0) masked relationships between immediacy and performance.

Table 2 also shows Pearson product moment correlations between immediacy behaviors and learning. Of the 26 students, 22 completed both the pre- and post-course tests. Within-subjects, two-tailed t-tests showed significant changes between students’ pre- and post-course test scores ($t = -27.20$, $df = 21$, $p < .0001$). The immediacy indicator Support was positively associated with learning. The immediacy indicator Agreement/Disagreement showed an association approaching significance with learning, as did Average Total Chat Participation.

To assess the relative contributions of Average Total Chat Participation and Support to learning, we performed a hierarchical regression analysis with Average Total Chat Participation and Support as predictor variables, and learning as the outcome variable. We entered Average Total Chat Participation into the equation first, and the regression model was not significant ($R^2 = .16$, $df = 1$, 20, $p > .05$). When we added Support to the regression equation, the two predictor variables accounted for a significant portion of variance in learning ($R^2 = .29$, $df = 2$, 19, $p < .05$), and the change in $R^2$ produced by adding Support approached significance ($F = 3.47$, $df = 1$, 19, $p < .08$). This indicated that despite its colinearity with participation scores ($r = .66$, $p < .0001$), Support accounted for unique variance in learning.

**DISCUSSION**

Our study was intended to explore the feasibility of measuring chat room immediacy behaviors, and to examine relations between these behaviors and learning outcomes. Our data suggests that student immediacy behaviors can be reliably coded from text responses in synchronous chat discussions. According to Riffe, Lacy, & Fico (1998), kappa coefficients from .80 to .90 are expected for established rating systems, but lower figures are permitted for new, developing measures such as ours. We thus achieved acceptable levels of coder agreement in this initial investigation, and acceptable levels of internal consistency for total average immediacy scores. As found by Rourke et al. (2001), indicators easily recognizable by coders (Vocatives, Paralanguage, Salutations & Phatics, Invitation) had higher kappa coefficients. Those that were more broadly defined (see Table 1 for definitions) and that perhaps required more interpretation by coders (e.g., Support, Emotion, Acknowledgement, and Appreciation/Approval) resulted in kappa coefficients ranging from .69 to .79.

Infrequency may have also reduced agreement for certain indicators. Inspection of Table 2 shows that seven of the indicators were scored, on average, in 3% or less of the mean responses across chat logs, and five of these seven (Emotion, Self-Disclosure, Self-Disclosure in Response to Course Material, Approval & Appreciation, Support) had kappa coefficients of .79 or
lower. Raters thus had less practice in scoring some immediacy behaviors, and this may have particularly lowered agreement for behaviors requiring more interpretation. Sampling more chat sessions per student, and refining operational definitions may improve coder agreement on indicators where kappa fell below .80. Agreement may also be improved by combining indicators into the larger affective, interactive, and cohesive categories suggested by Rourke et al. (2001) and Swan (2002), but validation of these categories would require factor analysis of data from larger samples than ours.

Students varied a great deal in immediacy behaviors, as well as in chat participation. As noted, 38% to 46% of students contributed no responses, at least in the sampled logs, involving Emotion, Humor, Self-Disclosure, Self-Disclosure in Response to Course Material, Value Statements, and Support. Again, sampling more chat sessions per student may improve detection of relationships between less frequent indicators and class outcomes. On the other hand, all students engaged in Acknowledgement and Salutations & Phatics, and the most commonly coded immediacy indicators were Acknowledgement and Invitation – none of which were associated with outcome variables.

Our small sample size no doubt limited our ability to test relations between immediacy indicators and student outcomes, as did the skewed distributions of some immediacy indicators. However, it is notable that despite these limitations, student Support behaviors predicted significant variance in learning above and beyond chat participation, and associations approaching significance were found between learning and the variables of Agreement/Disagreement and Average Total Chat Participation. Taken together, these variables may reflect enhanced student involvement with the course topic and with the learning community. Such involvement, while not related to test performance in the current sample, nevertheless may facilitate the arguably more important outcome of individual learning, which can be remarkable even if what is achieved in terms of grades or test scores is not. Our findings indicate that researchers in this area should include changes in pre- and post-course knowledge among their outcome measures, along with the more standard indices of examination scores, papers, and grades.

Support was a better predictor of learning than simple chat participation. Support was adapted from an interactive indicator Swan (2002) labeled Personal Advice, which she defined as “offering specific advice to classmates.” Based on our initial content analyses, we redefined the indicator to include helpful inquiries and expressions of empathy and encouragement, above and beyond simple acknowledgement of others’ responses or answers to direct requests. Of all immediacy indicators, Support had the lowest kappa coefficient. Our coders found it difficult to distinguish from simple Acknowledgement and from Approval & Appreciation, and had to rely more heavily than was the case with other indicators on the context, and not merely the content, of responses to infer students’ supportive intentions. Interpretation of the relationship between Sup-
port and learning must be qualified by the extent to which we were able to measure it reliably, and of course by our small sample size. However, it seems reasonable to conclude that students who were more empathic and helpful with each other also gained more from the course. Our results support Wang and Newlin’s (2002) contention that developing reciprocity and cooperation among students, one of the “Seven Principles of Good Practice in Undergraduate Education” identified by the American Association of Higher Education (AAHE, 1987), is key to the success of online learning communities. Online instructors may be able to enhance course outcomes by reinforcing students’ spontaneous efforts to support peers, and by designing collaborative course activities (e.g., study groups, group projects) that elicit supportive behaviors.

We did not assess relations among immediacy, learning, and student motivation and satisfaction. Given that immediacy may affect learning both directly and indirectly through its relationship with such attitudinal variables (Frymier, 1994), such assessment is warranted. Further, as recommended by Picciano (2002), the validity of the immediacy construct and its relation to course outcomes would be better tested in designs that include behavioral and self-report measures of predictor and criterion variables.

We achieved a moderate to high degree of reliability with our behavioral measure of student chat room immediacy. The measure may be used to assess student immediacy in asynchronous communications, such as bulletin board postings, and with some adaptation, to assess instructor immediacy in chat responses, asynchronous postings, and other course materials. This would allow validation of student reports of instructor immediacy with a more objective measure, as well as examination of the relative contributions of instructor and student immediacy to predicting outcomes across, as well as within, online learning communities.

Student and instructor immediacy may be viewed as outcome as well as predictor variables in the online environment. Changes in course requirements (e.g., grades based on more group than individual assignments) and/or design (e.g., use of instructor-narrated versus text-based lessons) are likely to affect immediacy and other forms of interaction among instructors and learners (Newlin and Wang, 2002). We encourage researchers to examine how course variables (requirements, design, technology) combine with student and instructor behavior to affect perceptions of closeness despite geographic distance, and to continue to explore the role of such perceptions in the quality of the online learning experience.

References


**Notes**

1 Student perceptions of instructor immediacy have also been assessed in televised and videotaped distance education courses, and appear to be positively related to perceived learning and course satisfaction in these course environments (Freitas, Myers, & Avtig, 1998; Guerrero & Miller, 1998; Hackman & Walker, 1990).

2 Definitions used by coders included additional inclusionary and exclusionary criteria, available upon request from the authors.

3 Composite scores for affective, interactive, and cohesive indicator categories were not related to outcome variables.

4 Immediacy indicators were not related to average examination scores in the sub-sample of students (n = 22) who completed the pre- and post-tests.

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