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Implementing Technology into the Basic Course: The Influence of Sex and Instructional Technology Use on Teacher Immediacy and Student Affective Learning

Paul D. Turman

The use of instructional technology (IT) has increased substantially over the past decade and continued advancements (e.g., online testing, course discussion threads, etc.) have fostered a learning environment that is continually changing the way courses, especially the basic course, are delivered (Downing & Garmon, 2001). Research has shown that the most significant innovation in the basic course over the past ten years have focused primarily on the use of video and computer technology. Morreale, Hanna, Berko and Gibson (1999) found that basic course directors reported the use of recent innovations which included “interactive (smart) classrooms, computer equipped practice labs, computer based tutorial packages, CD-Roms, and the internet for research activities, e-mail listserves, and home pages for the course” (p. 20). In accordance with this increased use of IT, scholars have explored various pedagogical outcomes associated with the use of IT in higher education. Despite this growing literature base, little is still known regarding how instructor use of specific forms of technology in the basic course influence student outcomes and perceptions of their communication behavior.

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Many scholars have criticized communication educators for integrating IT into the classrooms with limited empirical justification or support for enhancing student learning (Eadie, 1999; Lane & Shelton, 2001). Thus, the primary purpose of this investigation is twofold: (1) to explore the impact of varying degrees of instructional technology use on student perceptions of teachers' immediacy (i.e., verbal and nonverbal), and affective learning in the basic course; and (2) to determine whether such perceptions vary as a function of instructor sex.

This study hopes to clarify a number of issues related to IT use in the basic course. First, research indicates that the basic course is one class in which many graduate teaching assistants are exposed to their first teaching experience. During an investigation of eight institutions, Buerkel-Rothfuss and Gray (1990) found that 54% of introductory courses were taught by GTAs, and that most taught their own autonomous sections. Research has shown that new instructors are more likely to use new technologies as they develop their teaching skills in the classroom environment (Albion & Ertmer, 2002; Ertmer, Conklin, Lewandowski, Osika, Selo, & Wignall, 2003). Therefore, it is reasonable to assume that the basic course serves as a conduit for integrating new technology as a basic pedagogical function, making it worthy of further investigation.

Second, understanding the impact that technology use has on student perceptions of their instructor and their learning in the basic course is important. This is true especially for basic course directors who are often influential in fostering the development of instructional strategies for graduate teaching assistants. When dis-

cussing the resistance to instructional change in the classroom, Pajares (1992) found that change was easiest for new beliefs before teachers had a chance to develop their own instructional practices based on experience. If IT use does significantly influence student perceptions about their instructor, further investigation is warranted to understand the positive or negative influences that various forms of technology (e.g., presentational software, video material, course webpages, course chatrooms, online testing, overheads) have upon student perceptions and outcomes. This is important to consider before new teachers integrate various forms of technology into their teaching repertoire which may have a detrimental effect on their students.

INSTRUCTIONAL TECHNOLOGY

It is evident that technology will serve a valuable role in determining how students learn and interact in current and future classrooms. The endorsement for using IT has continued unabated in higher education for a variety of reasons, and an increase in class size and increased access to a university education has caused an administrative push for the replacement of traditional teaching methods. Gray (1989) argued that this increased economic pressure has had a significant impact on the instructional format utilized to teach the basic course. Often an increase in class size has been a traditional solution to this problem, (Gibson, et al., 1980; Gibson, Hanna, & Huddleston; 1985), however for many administrators the integration of technology is seen as another practical option. Frances, Pumer-

ante and Caplan (1999) indicated that instructional technology saves a university valuable staff time because fewer faculty can serve a larger number of students. They state that “Conventional wisdom, and this model, assert – either explicitly or implicitly – that using instructional technology in education will create cost savings, primarily by scaling up and in effect substituting instructional technology for faculty” (p. 30). In addition to the cost saving potential for the university, Frances et al., identified two important reasons universities will see an increased use of instructional technology. First, increased adult enrollment has fostered the use of distance learning. Second, tight budgeting by federal and state governments has failed to keep up with increasing enrollments, creating a push toward using instructional technology to meet the demand. Thus, faculty and administration develop a strong pedagogical argument for the incorporation of technology in the basic course.

Although scholars have advanced a number of theories explaining perceptions of communication technology (cf., Hertenstein, 1999; Walther, 1992), one related theory that is especially germane to the present inquiry is media richness theory (Daft & Lengel, 1984, 1986; Daft, Lengel, & Trevino, 1987). Daft and Lengel (1984, 1986) developed the concept of *media richness* to describe the extent to which different media bridge different frames of reference and reduce the uncertainty and equivocality behind different types of messages. They suggest that the richness of a certain media is influenced by the amount of personal information the medium carries, its capacity for immediate feedback, the number of cues and senses involved, and the medium’s use of natural

language (Daft & Lengel, 1984, 1986; Daft et al., 1987; Hertenstein, 1999). A rich medium, such as face-to-face interaction, would possess all four factors to a large extent, whereas a lean medium, such as a course webpage, is much more limited in the number of cues, personal information, and immediacy of feedback afforded by the medium. Media richness theory provides a theoretical framework for examining the decisions instructors face as they integrate different forms of technology into classroom instruction. At a minimum, this theory suggests that the use of instructional technology in the classroom serves as a communication behavior with potential to either enhance or detract from student learning.

Impact on Instructor Communication Behavior

Communication scholars have conducted significant research over the past 20 years to determine classroom variables influenced by both verbal and nonverbal immediacy behaviors. Although extensive, immediacy research has seen limited application to classroom environments utilizing IT. In a preliminary investigation of televised course, Hackman and Walker (1990) assessed the influence of system design (the use of instructional television) on student cognitive and affective learning, and the relationship between immediacy and learning. Their findings demonstrated that the system design and teacher immediacy directly influenced student affective and cognitive learning in televised classrooms. Those systems that were perceived to be more interactive also increased teacher immediacy levels, which then served to increase the potential for student learning. Carrell

and Menzel (2001) examined 120 first year undergraduate students to determine the influence of various delivery types on student state motivation, teacher immediacy, and perceived and actual learning. Using an experimental design (and placing students into either a live lecture, one delivered using video playback, and one with audio and PowerPoint displays) they found that immediacy varied across the three lecture types, with live lecture producing the highest levels of teacher immediacy across groups. However, student motivation and perceived and actual learning did not vary across delivery types. Turman, Davis and Gamble (in press) found that instructors who used presentational software and video material were perceived to have higher levels of verbal and nonverbal immediacy when compared to instructors not using these forms of technology. Additionally, they found that instructors teaching in distance learning classrooms were also perceived to have higher levels of verbal and nonverbal immediacy when compared to traditional classroom environments. These findings contradict Witt and Wheelless (2001) who found that less nonverbal immediacy was expected from telecourse teachers than from on-site professors.

When measuring the influence of technology use on teacher credibility, Schrodt and Turman (2004) found significant differences for student perceptions of instructor competence, trustworthiness, and instructor caring. Participants in their examination were asked to read a scenario, whereby an instructor described the use of technology for the course during the first day of class. For each scenario, the type and amount of technology was varied (e.g., no use, minimal use, moderate use, complete use) and participants were then assessed re-

garding their initial perceptions of the instructor's overall credibility. Main effects were observed for each of the competence dimensions, and results indicated that students rated instructors as most competent when they used moderate amounts of technology. Complete use and minimal use were ranked next, respectively. Instructors who used no technology were perceived by the students to be the least competent. For instructor trustworthiness and caring, students perceived instructors to display more of these qualities when using minimal or moderate amounts of technology as opposed to higher amounts to deliver course material.

Impact on Student Affective Learning

Because teacher communication behaviors play a vital role in creating and establishing an effective learning environment, instructional communication scholars have examined a variety of communication-based variables which influence both cognitive and affective learning within the college classroom. Yet, only a limited number of scholars have looked directly at the impact IT has on student affective learning. Specifically, Chadwick (1999) conducted two studies to examine the effects of course design (i.e., traditional lecture, web-supplemented, and virtual web-based course) on student cognitive learning and satisfaction. Findings indicated that students had similar levels of performance across the three course design types. However, students in the virtual classroom had stronger positive attitudes about the course when compared to the web-supplemented condition. Carrell and Menzel (2001) used an experimental design and found that immediacy varied across

the three lecture types (i.e., live lecture, video playback, and audio with PowerPoint display), with live lecture producing the highest levels of teacher immediacy across groups. Perceived cognitive learning was also highest in the live setting, followed by PowerPoint and video playback settings.

Most recently, Turman and Schrodtt (2004) used scenarios first developed by Schrodtt and Turman (2004), to assess the influence of technology use (i.e., no use, minimal use, moderate use, and complete use) on student reports of affective learning. Findings indicated a curvilinear effect, whereby student reports of affective learning were highest for minimal use of technology followed by moderate, complete and no technology use.

Research Question

It is evident that instructional communication has offered insight into the relationship between technology and a variety of instructor and student communication outcomes. However, there has been limited examination comparing immediacy levels to an instructor's use of varying levels of instructional technologies (e.g., PowerPoint, online testing, video, etc.) in the classroom, and the basic course specifically. Thus, it is reasonable to assume that as basic course instructors begin to utilize various forms of technology in their classrooms; their ability to establish immediacy with their students and foster an affective learning environment may be influenced.

Additionally, research reflecting sex-based differences for technology use has identified conflicting interpretations of how male and female instructors use tech-

nology in the classroom. For instance, Spotts, Bowman, and Mertz (1997) found no significant differences between male and female faculty ratings of their knowledge about/experience with audio, film, and video instructional technologies, or with distance learning, e-mail, the Internet, word processing and presentational software. Minor sex differences were observed for female instructors who were more likely than male instructors to be influenced to use IT based on ease of use, the potential for increased student learning, time commitment to learn, and technological support availability. Based on these findings, it is still unclear how sex and IT use would work together to influence student perceptions of instructor immediacy and their own affective learning. Thus, to test these assumptions and further expand our understanding of the influence of various forms of instructional technology use on immediacy and student affective learning in the basic course, the following research question was set forth:

RQ: How, if at all, does the differential use of instructional technology and instructor sex interact in influencing students' perceptions of their instructor's verbal and nonverbal immediacy and affective learning?

METHOD

Participants and Procedures

The participants for this study consisted of 1526 male ($n = 621$) and female ($n = 905$) undergraduate students enrolled in 72 sections of the basic course over the

span of four semesters. Students in an upper division quantitative methods course were given course credit for obtaining instructor consent and then distributing survey instruments to students in the basic course sections. Research was conducted in the natural setting of the classroom just prior to the start of class during the eighth week of the semester. For each course in which data was collected, the instructor was asked to leave the classroom and students were asked to voluntarily participate in this study and complete a human subject consent form. Students were asked to indicate their instructors' use of various form of technology up to that point in the semester. Of the sections described by these students, 53% of the instructors used presentational software to deliver course material, 48% used video, 26% implemented course webpages, 8% required participation in discussion threads or chatrooms, 7% used some form of online testing, and 63% used overheads.

Instrumentation

Teacher Verbal Immediacy. To assess student perceptions of their instructors' verbal immediacy levels in the classroom, the Gorham (1988) Verbal Immediacy Behaviors (VIB) scale was utilized. The VIB consists of 17 items designed to assess students' perceptions of their teacher's verbal immediacy behaviors. Participants chose from (0) never, (1) rarely, (2) occasionally, (3) often, and (4) very often when given statements such as "My instructor uses personal examples or talks about experiences she/he has had outside of class," and "My instructor invites students to telephone or meet with him/her outside of class if they have questions or want

to discuss something.” Previous reliability scores have been reported at acceptable ranges from .83 to .94 for the student report version (Christophel, 1990; Gorham, 1988). Alpha reliability scores for the version utilized in this study ($M = 2.39$; $SD = .72$) also fell within acceptable ranges at .88.

Teacher Nonverbal Immediacy. Students’ perceptions of their teacher’s nonverbal immediacy behaviors were assessed using Richmond, Gorham, and McCroskey’s (1987) Nonverbal Immediacy Behaviors (NIB) scale which consisted of 14 likert-scale items. Similar to the VIB, participants were provided with (0) never, (1) rarely, (2) occasionally, (3) often, and (4) very often for each of the items such as “My teacher sits behind a desk while teaching,” “My teacher moves around the classroom while teaching,” and “My teacher uses a variety of vocal expressions when talking to the class.” Previous reliability scores for this instrument have been reported between .73 and .89 (Christophel, 1990; Gorham, 1988; and Richmond et al., 1987), while alpha reliability scores fell within acceptable ranges at .75 for this study ($M = 2.55$; $SD = .56$).

Students’ Affective Learning. Affective learning was operationalized using a shortened version of Andersen’s (1979) Affective Learning Scale (ALS). The original 20-item measure is presented in a 7-point semantic differential format anchored by two bipolar adjectives. The ALS contains five dimensions of affect toward course, subject matter, and instructor, as well as engaging in the class prescribed behaviors and taking additional courses in the subject matter. Since previous factor analyses of the measure have yielded high inter-factor correlations, scholars have indicated that a single factor

treatment of affective learning is most parsimonious in light of research objectives (e.g., Avtgis, 2001; Kearney, 1994). Previous alpha reliabilities for the ALS have ranged from .86 to .98 (Avtgis, 2001; Gorham, 1988; Witt & Wheelless, 2001). In this study, the ALS ($M = 5.10$, $SD = 1.16$) produced strong reliability with a Cronbach's alpha coefficient of .93.

Design & Data Analysis

The data for research question one were analyzed initially using a two-way multivariate analysis of variance (MANOVA). Specifically, series of 2 x 2 factorial MANOVAs were obtained to examine the combined and unique influences of each type of technology ("used" x "not used") and instructor sex (male instructor x female instructor) on students' initial perceptions of instructor verbal and nonverbal immediacy, and affective learning. To further aid in the interpretation of significant interaction effects, univariate factorial analyses were obtained to provide the post-hoc cell comparisons. Alpha for all statistical tests was set at .05.

RESULTS

The results of the MANOVAs revealed a significant interaction effect of instructor gender by presentational software use, in addition to main effects for five of six technology types used by instructors in the basic course. Findings for each MANOVA will be presented according to type of technology used in the course.

Presentational Software

Results of the MANOVA identified a significant two-way interaction effect of instructor gender by presentational software use Wilks' $\lambda = .987$, $F(4, 1295) = 4.20$, $p = .002$ for each of the dependent measures. For teacher verbal immediacy ($F(4, 1295) = 8.92$, $p = .003$), cell comparisons revealed (see table 1) that students perceived male instructors who used presentational software ($M = 2.41$, $SD = .71$) and female instructors regardless of whether they used presentational software to have higher levels of verbal immediacy when compared to male instructors that did not use presentational software ($M = 2.19$, $SD = .79$). For teacher nonverbal immediacy ($F(4, 1295) = 7.41$, $p = .007$), post hoc cell comparisons showed that students perceived male instructors who either did ($M = 2.51$, $SD = .54$), or did not use ($M = 2.46$, $SD = .58$) presentational software to have possessed significantly less nonverbal immediacy compared to female instructors who did not use presentational software ($M = 2.64$, $SD = .57$). Additionally, students perceived female instructors using presentational software ($M = 2.57$, $SD = .55$) to have significantly higher amounts of nonverbal immediacy compared to males not using the software during class lecture. Finally, for student affective learning ($F(4, 1295) = 4.60$, $p = .032$), it appears that student reported significantly lower level of affect in classrooms with male instructors who did not use presentational software ($M = 4.86$, $SD = 1.22$) when compared with male instructors using presentational software ($M = 5.11$, $SD = 1.12$), and both female instructors using ($M = 5.16$, $SD = 1.16$) or not using the software ($M = 5.20$, $SD = 1.16$). For the main ef-

Table 1
Comparison of Instructor Gender Based on Presentational Software Use

| <i>Variable</i> | <i>Male Instructors</i> | | <i>Female Instructors</i> | |
|---------------------|--------------------------|-------------------------|---------------------------|--------------------------|
| | <i>Not Used</i> | <i>Used</i> | <i>Not Used</i> | <i>Used</i> |
| Verbal Immediacy | 2.46(.58) _{ac} | 2.51(.54) _a | 2.64(.57) _b | 2.57(.55) _{ab} |
| Nonverbal Immediacy | 2.19(.79) _a | 2.41(.71) | 2.47(.68) | 2.46(.66) |
| Affective Learning | 4.86(1.22) _a | 5.11(1.12) | 5.20(1.16) | 5.16(1.16) |

Note: Numbers in parentheses are standard deviations. Means displaying different subscripts in the same row differ at $p < .05$.

Table 2
 Comparisons of Immediacy and Affective Learning Based on Form of Technology Use

| <i>Form of Technology</i> | <i>Verbal Immediacy</i> | | <i>Nonverbal Immediacy</i> | | <i>Affective Learning</i> | |
|---------------------------|-------------------------|-----------|----------------------------|-----------|---------------------------|------------|
| | Used | Not Used | Used | Not Used | Used | Not Used |
| Presentational Software | 2.43(.70) | 2.35(.74) | ns | ns | ns | ns |
| Video Material | 2.46(.69) | 2.33(.73) | ns | ns | 5.17(1.16) | 5.03(1.16) |
| Course Webpage | ns | ns | 2.49(.56) | 2.57(.55) | ns | ns |
| Online Testing | ns | ns | 2.37(.56) | 2.56(.56) | ns | ns |
| Overhead | ns | ns | ns | ns | 5.17(1.17) | 4.96(1.13) |

Note: Numbers in parentheses are standard deviations.

fect of presentational software use, Wilks' $\lambda = .874$, $F(1, 1301) = 6.17$, $p = .013$, results revealed that that instructors using presentational software ($M = 2.43$, $SD = .70$) had significantly higher levels of verbal immediacy compared to those not using presentational software ($M = 2.35$, $SD = .74$).

Video Material

When assessing the influence of teacher video use, the MANOVA revealed no significant two-way interaction effect Wilks' $\lambda = .995$, $F(4, 1295) = 1.69$, $p = .14$, yet a main effect did exist for teacher verbal immediacy behaviors Wilks' $\lambda = .955$, $F(1, 1298) = 10.46$, $p = .001$. Students indicated that when their teachers used video during lecture in the basic course ($M = 2.46$, $SD = .69$) resulted in significant increases in student perceptions of verbal immediacy when compared to instructors who did not use video to assist in the delivery of course material ($M = 2.33$, $SD = .73$). A main effect also emerged for student affective learning Wilks' $\lambda = .955$, $F(1, 1298) = 11.87$, $p = .003$. Instructors using video to deliver course material ($M = 5.17$, $SD = 1.16$) received significantly higher scores for student affective learning compared to those not using video in their classroom ($M = 5.03$, $SD = 1.16$). See table 2 for comparisons based on technology use.

Course Webpage

The MANOVA for course webpage use showed no significant two-way interaction effect Wilks' $\lambda = .996$, $F(4, 1295) = 1.45$, $p = .21$, for any of the dependent meas-

ures, however a main effect existed for teacher nonverbal immediacy Wilks' $\lambda = .938$, $F(1, 1298) = 3.91$, $p = .048$. Findings revealed that instructors not using course webpages ($M = 2.57$, $SD = .55$) were perceived to have higher levels of nonverbal immediacy compared to those using webpages ($M = 2.49$, $SD = .56$).

Online Testing

When assessing the influence of teacher use of on-line testing procedures, the MANOVA revealed no significant two-way interaction effect, Wilks' $\lambda = .999$, $F(4, 1295) = .168$, $p = .95$. A main effect for teacher nonverbal immediacy did emerge, Wilks' $\lambda = .990$, $F(1, 1298) = 9.80$, $p = .002$. As reported with instructor course webpage use, a similar trend occurred for instructor use of online testing, whereby the use of online testing significantly decreased student perceptions of teacher nonverbal immediacy levels ($M = 2.37$, $SD = .56$) compared to those not using this delivery method ($M = 2.56$, $SD = .56$).

Overhead

The MANOVA for teacher overhead use revealed no significant two-way interaction effect, Wilks' $\lambda = .994$, $F(4, 1295) = 2.01$, $p = .09$, yet a main effect for student affective learning did emerge, Wilks' $\lambda = .994$, $F(1, 1298) = 9.09$, $p = .003$. Findings revealed that students reported higher levels of affective learning when their instructor used overheads ($M = 5.17$, $SD = 1.17$), when compared with those not using overhead to deliver course material ($M = 4.96$, $SD = 1.13$).

Course Chatroom

When assessing the influence of course chatroom use, the results of the MANOVA revealed no significant two-way interaction effect of gender by chatroom use, Wilks' $\lambda = .999$, $F(4, 1295) = .238$, $p = .91$, in addition to no main effects Wilks' $\lambda = .994$, $F(1, 1298) = 3.24$, $p = .072$.

DISCUSSION

Instructional technology will continue to be a viable and important instructional strategy of interest to communication scholars, and for those teaching the basic course. However, IT use within the basic course must be grounded upon both practical and pedagogical decisions. A number of communication scholars have indicated a need to empirically examine and critically assess the impact IT has the college classroom (Lane & Shelton, 2001; Shedletsky & Aitken, 2001). Specifically, Lane and Shelton (2001) indicated that "...too many educators are latching onto the most recent wave of technological advance without fully considering fundamental practical and evaluative pedagogical issues" (p. 242). Thus, to empirically examine some of the pedagogical issues which influence the practical use of IT in the basic course, this study examined how the use of different forms of IT interact with teacher sex to influence students' perceptions of their instructors immediacy and affective learning.

Overall, the major findings from this analysis indicate significant differences for verbal and nonverbal

immediacy and student affective learning when examining the combined effect of gender and presentational software use. For each of these variables, male instructors who did not use presentational software to deliver material in the basic course were more likely to be perceived as having less verbal immediacy, fewer nonverbal immediacy behaviors, and producing lower levels of affective learning. The findings from this analysis are one of the first to report perceived differences based on instructor sex. Specifically, results of this analysis contradict those obtained when examining the combined influence of instructor sex and IT use for student affective learning (Turman & Schrodt, 2004) and instructor credibility (Schrodt & Turman; 2004). Additionally, Spotts et al. (1997) found no significant differences between male and female faculty ratings of their knowledge about/experience with audio, film and video IT, as well as with distance learning, email, the Internet, word processing and presentational software.

One potential explanation may exist for these contradictions. Because scholars have conceptualized technology as masculine (Wajcman, 1991), it may suggest that male instructors who did not use presentational software to deliver material were viewed more negatively than female instructors. Students in the basic course may already have a preconceived notion of an instructor who should use various forms of IT. When this expectation is violated, it could influence student negative perceptions of their male instructors' verbal and nonverbal immediacy, and their own perceived affective learning.

When examining the main effects of IT use on each of the dependent variables, findings indicated that basic

course instructors' use of both verbal and nonverbal immediacy were influenced. Specifically, the use of presentational software and video material positively influenced perceptions of verbal immediacy. These findings are interesting to note because one might assume that as an instructor's reliance on presentational software and video material increase, his or her ability to build psychological connection with students verbally would decrease. However, students in this study indicated a different perspective; potentially suggesting that instructors who use each of these forms of IT have also established methods verbally that help to seamlessly blend the visual mediums with their verbal interaction. Another potential explanation for these findings could come from recent research on "vicarious immediacy." A number of scholars have recently argued that the traditional definition of immediacy is not applicable when applied to classrooms that use significant amounts of IT (LaRose, Gregg, & Eastin, 1998; O'Sullivan, Lippert, Hunt, Owens, & Rowe-Whyte, 2002). LaRose et al. (1998) used the term "vicarious immediacy," to describe the perceptions of immediacy students perceive as a result of viewing interaction that occurs between instructors and fellow students. To further examine this notion of vicarious immediacy, LaRose and Whitten (2000) examined the course content of three web courses. Their findings indicated that it was possible for instructors to foster an immediate teaching environment in online instruction through the use of "social approval and social interest incentives as well as status recognition and status enhancement cues" (p. 332). Vicarious immediacy was also present in instances where students were allowed to listen to prerecorded teacher-student interac-

tion. Conversely, the implementation of course webpages and online testing inversely affected perceived levels of nonverbal immediacy by instructors in the basic course. These findings are supported by previous research which has examined the impact of specific forms of technology on teacher-student relationships. Specifically, Waldeck, Kearney and Plax (2001) in their examination of teacher-student email, found a strong relationship between e-mail communication and teacher message strategies which were representative of high levels of teacher immediacy. Also the more students used e-mail, the more likely they were to use it for what Waldeck et al. referred to as “non-instructional purposes” (p. 67).

As one would expect, main effects were also present for each form of IT use except for online testing when examining student perceptions of their instructors overall technology use in the basic course. For basic course instructors who used presentational software, video material, course webpage, course chatroom, online testing, and overheads, students perceptions were significantly higher compared to those instructors who did not use these forms of technology.

Finally, main effects for IT use were identified for student perceived levels of affective learning for use of video material and overhead use, in which the use of these mediums appeared to significantly increase student affective learning. These findings support Carrell and Menzel (2001) who found student affect toward the teacher and willingness to enroll in a course with the same instructor to be higher for the live condition compared to those in which video and PowerPoint were used. Despite the importance of the above results in re-

gards to student affective learning in the basic course, an equally important implication of these findings can be found in those results that were not statistically significant. For example, it is interesting to note that student affective learning was not directly influenced by the use of IT that have been most commonly implemented in the college classroom (e.g., presentational software, course webpages, course chatrooms). As a result, it appears evident that students believe they require at least moderate levels of IT use to increase their affective learning. Additionally, the findings demonstrate that students are still hesitant to learn in a classroom environment dominated by IT. These findings could be explained by research that has found students view IT as a distraction to the classroom experience because of problems associated with limited audio/visual quality (Comeaux, 1995; Hackman & Walker, 1990; McHenry & Bozik, 1995), technical support (Downing & Garmon, 2001), and faculty training (Comeaux, 1995). Lane and Shelton (2001) further claim that when instructors are making decisions about IT use they neglect to consider a number of practical questions; rather a “that’s cool technology, let’s use it” mentality is employed (p. 242). As a result, it is likely to assume that many students have experienced instructors who have used IT but felt that it did not enhance their educational experience.

Theoretically, the results of this study extend the general propositions of media richness theory (Daft & Lengel, 1984, 1986). In general, the results suggest that a combination of face-to-face instruction and IT enhances a students’ perception of their instructors’ verbal immediacy (for presentational software and video mate-

rial) in addition to their own affective learning (for video material and overheads). This finding, in turn, lends further support to the underlying principle for this theoretical perspective which suggests that a good match between the characteristics of a medium (or mediums) and one's communication activities will lead to optimal performance. Perhaps the use of IT allows an instructor to combine the social presence of face-to-face instruction with the media richness of presentational, video and overhead resources; resources that may help reduce the uncertainty and equivocality surrounding the instructor, the assignments, and the course content. The findings for student perceptions of their teachers' nonverbal immediacy also lend support to the propositions of media richness theory. When course webpages and online testing were used by instructors, students perceived a lower level of nonverbal immediacy. For instance, the use of online testing (regardless of the level of interactivity or richness of media provided for the students) served to decrease the potential physical presence of the instructor.

Limitations and Future Research

Despite the contributions of this study, the results should be interpreted within the limitations of the research design. The most limiting factor in this study was the use of a measure of instructor verbal immediacy that has raised validity issues with communication researchers. Most notably Robinson and Richmond (1996) argued that Gorham's (1988) VIB is "composed of items representing verbally effective behaviors of teachers," rather than a direct assessment of verbally immediate

behaviors (p. 82). As a result, caution should be used when interpreting the results for verbal immediacy regarding presentational and video materials by instructors in the basic course. Results may better signify that the instructors using these mediums were more verbally effective for the students in their course. Another limitation stems from the method in which data on instructor technology use was collected. Students were asked to indicate “yes” or “no” for each of the six IT types. Although this provides an initial glimpse into student perceptions based on these simple classifications, it provides limited insight into the effectiveness of these IT methods. For instance, IT literature is overflowing with accounts of instructor use of technology for its own sake (Shaw, 2003; Walsh & Frontczak, 2003). Thus, those instructors in this study who did not use one of the six forms of technology may have read the warnings associated with their use (e.g., over reliance on PowerPoint by students for note taking, limited student access to the web, etc.) and reduced his/her reliance. There is also a significant difference between an instructor who has a course website with basic information about the course, and one who uses the site to continually update students on course assignments, happenings in the course, and provides update links that produce an interactive learning experience. Future research might extend these efforts by better evaluating the instructors’ use of technology through the use of a more elaborate quantitative assessment. This could include the measure of student perception of IT quality, frequency of use by the instructor, and perceived contribution to student cognitive learning in the course.

Overall, the findings from this investigation suggest that instructors in the basic course should proceed with caution when making decisions about how IT will be used to support the design of their course. This is especially true when examining the role of the basic course director who controls the pedagogical development of GTAs and inexperienced teachers. As the findings from this investigation indicate, instructor verbal and non-verbal behavior can be influenced by the amount and form of IT used to facilitate the delivery of classroom material. It also has an impact on student affective learning in the basic course for both male and female instructors. As Flanagin (1999) indicated “Instructional tools should be selected on the basis of what they might potentially add to the education experience and not simply in order to invoke the latest technological gadgets” (p. 15). When IT begins to serve as the catalyst for guiding instructional methods without considering the impact on communication behaviors or student learning, it provides further motivation for those controlling the basic course to better understand the influence such decisions have on a variety of classroom variables.

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