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The Influence of Course Format, Student Characteristics, and Perceived Teacher Communication and Behavior on Instructional Outcomes Before and During the COVID-19 Pandemic

Elizabeth E. Graham , Heather L. Walter , and Tang Tang

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Abstract: Two studies examined instructional format (intact vs. hybrid and remote vs. online), classroom climate, student characteristics (engagement and communication apprehension), perceived teacher communication and behavior (teacher competence, clarity, caring), and their influence on instructional outcomes, including cognitive learning, communication satisfaction, and intent to persist in college pre-pandemic and during the pandemic. The findings highlight the important role teacher characteristics (caring, clarity, competence) played in instructional outcomes. This study also revealed that high levels of engagement signals students' willingness to participate in the learning process. Students are a driving force in their own cognitive learning, communication satisfaction, and intent to persist in college. No statistically significant differences were found in instructional outcomes across various instructional formats.

Introduction

Since instructional communication first emerged as an area of study, scholars have been challenged to identify teacher and student behaviors that have a profound effect on student success. There are several instructional communication theories and models that focus on the impact of teacher behaviors and

Elizabeth E. Graham, Kent State University, Kent, OH
Heather L. Walter, The University of Akron, Akron, OH
Tang Tang, Kent State University, Kent, OH
CONTACT: egraha18@kent.edu

student characteristics on the teaching–learning process. For example, McCroskey et al.'s 2004 General Model of Instructional Communication identifies constructs responsible for affective and cognitive learning. Likewise, Weber et al. (2011) developed the Instructional Beliefs Model that is a three-tiered theory that suggests teacher behaviors, student characteristics, and course structural issues combine to influence students' instructional beliefs. According to Weber et al. these instructional beliefs then drive affective and cognitive student learning.

These prior research efforts informed this study and we relied on several instructional communication factors pertinent to learning and teacher evaluation. In particular, McCroskey and colleagues' research concluded that teacher temperament, students' perceptions of their teachers' source credibility, and task attractiveness were associated with learning. Consistent with McCroskey's model, Weber et al.'s Instructional Beliefs Theory also suggested that student learning is influenced by teacher communication, student characteristics, course organization, and structural issues (i.e., classroom policies and procedures, and course assignments and workload). While this present research effort reflected a similar pursuit, that is, determining the communication factors that influence student learning, and several of the same variables were employed, there were several departures as well. Most importantly, we examined instructional format (i.e., intact, hybrid, remote, online) and environment, as a defining framework and as an influencing factor of student learning, communication satisfaction, and intent to persist through college.

Because the global pandemic began after our first study and during our second study, we took advantage of the unique research opportunity afforded to us to compare instructional formats for possible differences in learning outcomes. Specifically, we examined instructional format (intact vs. hybrid and remote vs. online), classroom climate, student characteristics (engagement and communication apprehension), perceived teacher communication and behavior (teacher competence, clarity, and caring), and their influence on instructional outcomes, including cognitive learning, communication satisfaction, and intent to persist in college pre-pandemic (November 2019) and during the pandemic (April 2021).

Instructional Format and Environment

The first factors considered were course format and the classroom climate of the basic communication course. The basic communication course has been dubbed the "front porch" of the communication discipline as it introduces students to the field and often recruits undergraduates into the communication major (Beebe, 2013). The basic course is currently taught, nationwide, in a variety of delivery formats, all of which are worthy of assessment and consideration for their instructional outcomes (Sellnow-Richmond et al., 2020).

The system comprising the instructional environment is holistic with teachers and students mutually influencing each other, all within a dynamic and ever-evolving classroom environment (Witt et al., 2014). As noted by Kearney and Beatty (1994), the classroom is a highly interdependent system of interrelated components subsuming a multitude of teacher and student behaviors. Course format is an integral component of this system and the present studies attempted to define its relationship with a number of other key variables in the learning environment. For these reasons, the instructional environment is a central element in this study.

The traditional intact face-to-face (F2F) basic course format, the most prevalent course delivery method pre-pandemic (Morreale et al., 2016), consists of approximately 20–25 students receiving instruction

from one instructor, at one point in time, in a shared classroom space. Indeed, the face-to-face format is considered to be superior to other platforms (Fassett & Atay, 2022). Regardless, over the last few decades, declining student enrollment and shrinking budgets, coupled with pedagogical advances, and enhanced technology prompted communication programs to implement innovative delivery methods in the basic communication course. In addition to the traditional intact F2F (hereafter referred to as intact), hybrid and asynchronous online formats have also become ubiquitous. The hybrid format features a portion of the course delivered online with F2F recitation sections devoted to speech presentations and student activities (Sellnow & Martin, 2010). The hybrid model offers greater instructional consistency, decreased cost of delivering a high enrollment course, and streamlined administrative oversight. The hybrid format provides highly consistent, assessment-friendly, student-driven online lectures, while maintaining regular in-person contact with students to counter known issues of low motivation, trust, and to develop a positive classroom climate via the recitation experience (Zuhri & Amiruddin, 2021).

Several research teams (Abdullah et al., 2019; Broeckelman-Post et al., 2020; Mahoney et al., 2017; Zuhri & Amiruddin, 2021) concluded that students in the blended (hybrid) courses scored higher than the intact group on some cognitive, behavioral, and affective measures and performance skills, while decreasing levels of communication apprehension. Alternatively, Cox and Todd (2001) revealed that students enrolled in the intact course reported more instructor credibility, student motivation, and immediacy than students who experienced the hybrid course format. Furthermore, intact formats benefit from the long-held and enviable perception that this format provides students with a better educational experience (Wright, 2022).

A third course format increasingly featured in the basic course is the asynchronous online model. Broeckelman-Post et al. (2019) conducted a comprehensive assessment of online versus intact public speaking courses and found that despite expectations, there was no significant difference in speech performance or course performance. However, online courses did produce significantly higher student drop and failure rates than F2F courses. These results highlight the assumption that F2F courses are largely a superior instructional format.

In addition to the instructional course format, classroom climate is an important contributor to the instructional environment. Dwyer et al. (2004) defined a connected classroom climate as "student-to-student perceptions of a supportive and cooperative communication environment in the classroom" (p. 267). Previous research suggested that social support can increase academic achievement (Cutrona et al., 1994). A connected classroom climate is positively correlated with connectedness to students in class, a history of making friends in the class, motivation to enroll in another class with those same students, and a good measure of how much they liked the class (Dwyer et al., 2004). Broeckelman-Post and Pyle (2017) found that students who completed a public speaking course (regardless of course format) experienced an increase in connected classroom climate.

Teacher Communication and Behaviors

Instructional format and instructional environment are only two important considerations. The second set of factors that predict instructional outcomes were teacher communication and behaviors. Since 1978, when Hurt and colleagues first published a book that focused on classroom communication, scholars have explored the impact of various teacher behaviors on students' classroom experience and concluded that instructor communication and behaviors are highly influential to student learning and

success (Mazer & Graham, 2015). Ledbetter and Finn (2018) asserted that teacher communication behaviors influence learner empowerment and are central to students' success. Indeed, much of the early instructional research focused on individual differences among students and subsequent research focused on how teachers approach communication in the classroom (Mottet et al., 2006).

Teacher credibility is conceptualized by Teven and McCroskey (1997) as comprised of three dimensions: competence, trustworthiness, and caring and contributes to an increase in students' intent to persist in college (Schrodt & Finn, 2011; Witt et al., 2014). Indeed, McCroskey et al. (2004) positioned instructor credibility as the primary student perception that ultimately impacts learning outcomes. Communication research consistently confirmed that teacher credibility and teacher clarity foster the student–teacher relationship and have a positive effect on student affect and learning (Schrodt et al., 2009).

Caring has been conceptualized as encompassing empathy, understanding, and responsiveness (McCroskey, 1992; McCroskey & Teven, 1999). This means that instructors appreciate students' perspective, have insight into what students are feeling, and are attentive to their needs. Research reveals that instructors who are caring will be perceived positively by their students, and students will evaluate the course more favorably, and also report that more affective and cognitive learning occurred (Teven & McCroskey, 1997).

The last teacher communication and behavioral practice to consider is teacher clarity. Clarity is an adaptive process whereby teachers assure that students understand course content by using feedback loops such as questions and assessment opportunities and adjust communication to meet student needs (Civikly, 1992). Teacher clarity enhances students' ability to organize and maintain information which facilitates their learning. Clarity occurs when students deeply process information (Bolkan, 2016; Bolkan & Goodboy, 2019).

Recent research (Bolkan & Goodboy, 2020) further illustrated the clarity and learning connection and concluded that student learning was increased when they were presented abstract definitions before concrete examples. Order does matter. They reasoned that the abstract information limited the burden of cognitive overload, and this facilitated students' understanding thereby paving the way for concrete examples. In an extensive meta-analysis, Titsworth et al. (2015) concluded that teacher clarity produces greater student learning because meaning occurs when students "receive information, can integrate new information into existing schema, and can then activate appropriate schema to accomplish tasks" (p. 387).

Student Characteristics

The third set of factors to predict instructional outcomes were student characteristics. Kearney and Beatty (1994) encouraged scholars "to examine students as active communicators in the teacher-student classroom exchange and to focus on students' communication behaviors" (p. 12). Specifically, student characteristics such as student engagement and communication apprehension are critical to cognitive learning, communication satisfaction, and intent to progress in college. Indeed, Weber et al. (2011) noted a plethora of studies that bore out the positive relationship between student characteristics and learning outcomes; evidence that researchers heeded Kearney and Beatty's (1994) earlier call.

Academic engagement time is considered a good predictor of learning (Frymier & Houser, 1999). Engaged students prepare for class ahead of time, listen during class, and participate in class discussions. Mazer (2012) identified specific behaviors that included oral and silent behaviors, as well as behaviors

indicative of student engagement inside and outside the classroom. Specifically, interested students who spent the most time engaged in attending or interacting with course materials and others in the classroom environment experienced the highest levels of academic achievement (Mazer, 2012).

Another relevant student characteristic is communication apprehension, defined as "an individual's level of fear or anxiety with either real or anticipated communication with another person or persons" (McCroskey, 1977, p. 78). Communication apprehension impacts student success in the classroom (Bourhis et al., 2006), self and other perceived competence (Rubin et al., 1997), and persistence and dropout rates (McCroskey et al., 1989). High communication apprehensive students skip class more often and are lower achievers (Byrne et al., 2012). Bourhis and Allen (1992) conducted a meta-analysis and concluded that there is a significant negative association between communication apprehension and cognitive performance which negatively impacts the learning process.

Instructional Outcomes

The fourth set of factors includes several instructional outcomes such as cognitive learning, student satisfaction, and intent to persist in college. Cognitive learning emphasizes students' abilities to make sense of and master course concepts and content. In the words of McCroskey and colleagues (2004), "The primary outcomes of instructional communication are concerned with learning" (p. 199). Airasian and colleagues (2001) further distinguished between various phases of learning where students begin by mastering course content through the retention of information, progress to analyzing and synthesizing information, and reach a stage that includes critical evaluation. Students' progress beyond simple recall and retention of material to higher levels of learning to analyze, synthesize, and critically evaluate course information. Students who learn more will be able to recall information, apply that information to practical situations, and create connections among course content and materials. Frisby et al. (2014) conceptualized cognitive learning as emphasizing Bloom et al.'s (1956) educational objectives, which reflect recall, knowledge, understanding, and development of skills.

Communication satisfaction, the second instructional outcome, was conceptualized by Goodboy et al. (2009) as reflective of satisfaction with instrumental versus relational aspects of students' affective response to communication with an instructor over the course of the term. "Student communication satisfaction with an instructor is linked with student retention and . . . therefore, represents a positive educational outcome" (Sidelinger et al., 2016, p. 575). Furthermore, researchers determined that student communication satisfaction with teachers is related to student motivation, learning, interest, and student communication behaviors such as out-of-class communication, instructor motives for communicating, and instructor communication behavior (Goodboy et al., 2009). Earlier Jones (2008) reported similar findings and determined that students reported the most communication satisfaction and motivation to learn with highly supportive instructors.

Teacher behaviors are powerful predictors of cognitive learning, student satisfaction, and intent to persist in college (Witt et al., 2014). Research reveals that students will likely persist in college if there is "positive contact with faculty and meaningful engagement in student activities" (Witt et al., 2014, p. 333). Without question, students' out-of-class contact with instructors is central to retention and academic performance (Sidelinger et al., 2016). Instruction inside and outside the classroom matters and "skillful communication is one of the keys to helping students sustain positive attitudes toward persistence in academic programs" (Witt et al., 2014, p. 346).

In our first study we considered the impact of the instructional format (intact, hybrid) in regard to the classroom climate, student characteristics, and perceived teacher communication and behavior on students' perceived cognitive learning, communication satisfaction, and intent to persist in college. Therefore, the following research questions were posed:

> **RQ1:** What are the similarities and differences between intact and hybrid courses in instructional environment, student characteristics, perceived teacher communication and behaviors, and instructional outcomes?

> **RQ2:** What factors predict students' perceived (a) cognitive learning, (b) communication satisfaction, and (c) intent to persist in college by course delivery format (i.e., intact vs. hybrid)?

Study 1—Methods

Participants and Procedures

For Study 1, an online survey was conducted in November 2019 (pre-COVID-19 pandemic) to examine similarities and differences between intact and hybrid courses and predictors of instructional outcomes. Participants were recruited from the introductory basic communication course at two large Midwestern public universities. To ensure data quality, attention-check questions were used in this study. Those who did not pass the attention-check questions were automatically guided to the end of the survey and their responses were discarded.

Overall, 379 participants successfully completed the survey. Among the participants, 155 (40.9%) were from intact (F2F) courses and 224 (59.1%) were from hybrid courses. In addition, 60.4% (n = 229) were female and 39.6% (n = 150) were male, ranging from 18 to 34 years old with a mean age of 19.08 (SD = 2.04). More than half (65.7%, n = 249) were first-year students and 83.6% of the participants (n = 317) reported they were White or Caucasian.

Measurements

Dwyer et al.'s (2004) Connected Classroom Climate Scale measured instructional environment. Participants rated each of the 18 statements (e.g., the students in my class show interest in what one another is saying) on a 5-point Likert scale. The responses were summed and averaged to create the measure *connected classroom climate* (α = .939; M = 4.00; SD = .53).

Mazer's (2012) Student Engagement Scale asked participants to rate three items that represented four types of behaviors on a 5-point Likert-type scale: *oral in-class behaviors* (e.g., participated during class discussions; α = .843; M = 3.85; SD = .85), *silent in-class behaviors* (e.g., listened attentively to the instructor during class; α = .776; M = 4.31; SD = .51), *out-of-class behaviors* (e.g., studied for a test or quiz; α = .743; M = 3.29; SD = .74), and *thinking about course content* (e.g., thought about how the course material related to my life; α = .881; M = 3.78; SD = .82).

Communication apprehension was measured with the Personal Report of Communication Apprehension Scale (PRCA-24; see McCroskey et al.'s, 1985 measure). Participants rated six statements that addressed fear or anxiety in various situations on a 5-point Likert scale (α = .859; M = 2.77; SD = .84).

Teacher competence and teacher caring were measured using McCroskey and Teven's (1999) six semantic differential items that measured instructor competence on a 5-point scale in which participants rated (e.g., expert–inexpert) and six items that measured caring (e.g., concerned about me–not concerned about me). Indices of *teacher competence* (α = .949; M = 4.48; SD = .77), and *teacher caring* (α = .956; M = 4.27; SD = .98) were created respectively and used in the subsequent analyses.

Teacher clarity was measured with the Clarity Behaviors Inventory (Titsworth et al., 2004). Participants rated 12 statements that measure teacher's written and oral clarity (e.g., the teacher explains how we are supposed to see relationships between topics covered in the lecture) on a 5-point Likert scale. The responses were summed and averaged to create the measure of *teacher clarity* (α = .945; M = 4.06; SD = .76).

Three instructional outcomes were measured: perceived cognitive learning, communication satisfaction, and intent to persist in college. Cognitive learning was assessed with the Cognitive Learning Measure (Frisby et al., 2014). Participants were asked to rate 10 statements on a 5-point Likert scale (e.g., I can see clear changes in my understanding of this topic). The responses were summed and averaged to create the measure *cognitive learning* (α = .859; M = 3.93; SD = .64).

Student communication satisfaction was measured using Goodboy and colleagues' (2009) Student Communication Satisfaction Scale. Participants rated each of the eight Likert-based statements to reflect their satisfaction with their communication with their instructor (e.g., I usually feel positive about my conversations with my teacher; α = .946; M = 3.95; SD = .84).

Intent to persist in college (V. E. Wheeless et al., 2011) was measured on a 5-point semantic differential scale on four items (e.g., give up/keep going) to indicate the degree to which their instructor influenced their intent to persist in college. The mean of these items operationally defined *intent to persist in college* (α = .981; M = 4.49; SD = .80).

Results

RQ1 asked if there were differences between intact and hybrid courses across all instructional predictors and outcomes. Independent t-test results failed to reveal any significant differences for all 12 variables measured in this study. Specifically, intact and hybrid formats were not different in instructional outcomes (cognitive learning: t = –.64, p = .52; communication satisfaction: t = –.87, p = .39; intent to persist: t = –.22, p = .82); instructional environment (connected classroom climate: t = –.43, p = .67); student characteristics (communication apprehension: t = 1.24, p = .22; silent in-class behaviors: t = .27, p = .79; oral in-class behaviors: t = –.51, p = .61; out-of-class behaviors: t = –.14, p = .89; thinking about course content: t = .16, p = .87); and perceived teacher communication and behaviors (teacher competence: t = –.12, p = .91; teacher caring: t = .10, p = .92; teacher clarity: t = .10, p = .92). Results indicated that contrary to conventional thinking, there may be more similarities (than differences) in instructional outcomes, as well as student and teacher communication across different delivery formats (intact and hybrid).

TABLE 1
Similarities and Differences Between Intact and Hybrid Course Formats (Study 1)

Variables	Intact		Hybrid		*t*	*p*
	M	*SD*	*M*	*SD*		
Instructional Outcomes						
Cognitive learning	3.90	.63	3.94	.66	–.64	.52
Communication satisfaction	3.90	.88	3.98	.82	–.87	.39
Persist in college	4.48	.74	4.49	.84	–.22	.82
Instructional Environment						
Connected classroom climate	3.98	.53	4.01	.52	–.43	.67
Student Characteristics						
Communication apprehension	2.83	.79	2.72	.87	1.24	.22
Oral in-class behaviors	3.83	.88	3.87	.82	–.51	.61
Silent in-class behaviors	4.32	.50	4.31	.52	.27	.79
Out-of-class behaviors	3.28	.74	3.29	.75	–.14	.89
Thinking about course content	3.79	.83	3.77	.82	.16	.87
Teacher Characteristics						
Teacher competence	4.47	.71	4.48	.82	–.12	.91
Teacher caring	4.28	.92	4.27	1.02	.10	.92
Teacher clarity	4.06	.76	4.05	.77	.10	.92
$N = 379$ (155 intact mode; 224 hybrid mode)						

RQ2 asked which factors predicted instructional outcomes. Multiple linear regression analyses were calculated to predict perceived cognitive learning for students from intact and hybrid courses, respectively. For the *intact* classes, a significant regression equation was found ($F = 15.11$, $p < .001$) with an R^2 of .484 (adjusted $R^2 = .452$). Table 2 provides a summary of the regression analyses for students' perceived cognitive learning by course format with standardized regression coefficients. Specifically, the analysis indicated that three factors significantly predicted perceived *cognitive learning* for students from *intact* classes. Teacher clarity was the strongest predictor, followed by teacher competence, and student thinking about course content. For students enrolled in *hybrid* courses, three factors significantly predicted their perceived cognitive learning. Thinking about course content was the strongest predictor, followed by their silent in-class behaviors, and teacher clarity. The regression equation was significant ($F = 23.57$, $p < .001$) with an R^2 of .498 (adjusted $R^2 = .477$).

TABLE 2
Predictors of Perceived Cognitive Learning by Intact and Hybrid Courses (Study 1)

Predictors	Intact	Hybrid
Instructional Environment		
Connected classroom climate	.076	.104
Student Characteristics		
Communication apprehension	–.041	–.003
Oral in-class behaviors	–.093	–.083
Silent in-class behaviors	.076	**.222*** **
Out-of-class behaviors	.086	.088
Thinking about course content	**.198***	**.264*** **
Teacher Characteristics		
Teacher competence	**.271****	.023
Teacher caring	–.063	.171
Teacher clarity	**.371*** **	**.186****
Final R^2	**.484**	**.498**

***$p \leq .001$; **$p \leq .01$; *$p \leq .05$

In reference to communication satisfaction, three factors significantly predicted communication satisfaction for students in *intact* courses. Teacher caring was the strongest predictor, followed by teacher clarity, and students' silent in-class behaviors. Together, a significant regression equation was found ($F = 42.01$, $p < .001$) with an R^2 of .723 (adjusted $R^2 = .706$; see Table 3). For students enrolled in *hybrid* courses, five factors significantly predicted their communication satisfaction, including teacher caring, teacher clarity, connected classroom climate, thinking about course content, and their silent in-class behaviors. The regression equation was significant ($F = 41.81$, $p < .001$) with an R^2 of .637 (adjusted $R^2 = .622$).

TABLE 3
Predictors of Communication Satisfaction by Intact and Hybrid Courses (Study 1)

Predictors	Intact	Hybrid
Instructional Environment		
Connected classroom climate	.012	**.157****
Student Characteristics		
Communication apprehension	–.019	.034
Oral in-class behaviors	.078	–.021
Silent in-class behaviors	**.113***	**.118***
Out-of-class behaviors	.067	–.039
Thinking about course content	.061	**.119***
Teacher Characteristics		
Teacher competence	.100	.061
Teacher caring	**.552*** **	**.371*** **
Teacher clarity	**.143***	**.297*** **
Final R^2	**.723**	**.637**

***$p \leq .001$; **$p \leq .01$; *$p \leq .05$

Finally, for students enrolled in *intact* courses, two factors significantly predicted their intent to persist in college: silent in-class behaviors and teacher competence .462 (adjusted R^2 = .429; see Table 4). On the other hand, three factors predicted intent to persist in college for students in *hybrid* courses. Teacher clarity was the strongest predictor, followed by teacher competence, and teacher caring. This regression equation was significant as well (F = 19.20, p < .001) with an R^2 of (adjusted R^2 = .423).

TABLE 4
Predictors of Intent to Persist in College by Intact and Hybrid Courses (Study 1)

Predictors	Intact	Hybrid
Instructional Environment		
Connected classroom climate	.036	.110
Student Characteristics		
Communication apprehension	–.001	.056
Oral in-class behaviors	.092	–.014
Silent in-class behaviors	**.273*** **	–.040
Out-of-class behaviors	.039	.008
Thinking about course content	.112	.023
Teacher Characteristics		
Teacher competence	**.225****	**.267****
Teacher caring	.124	**.265****
Teacher clarity	.064	**.209****
Final R^2	**.462**	**.447**

***$p \leq .001$; **$p \leq .01$; *$p \leq .05$

Study 2

In March 2020, the COVID-19 pandemic changed the course delivery methods of academic courses across the country. By necessity, this global health crisis marshalled in different delivery formats for the basic communication course and instructors were immediately compelled to adapt to virtual instructional models (Morreale et al., 2021). In our case, the pandemic required faculty to employ remote and online learning formats.

In view of these instructional circumstances, we wondered if the required move to online and remote learning would, in the words of Roy Schwartzman (2021), creator of the popular social media site Pandemic Pedagogy, produce not a mere interruption but rather a "transformation of what communication instruction is and how it operates" (p. 18). A special issue of *Communication Education* dedicated to instruction and pandemic pedagogy featured Miller et al.'s (2020) call for researchers to: ". . . conduct replication studies to examine how communication functions related to previously studied communication-related concerns (e.g., classroom climate, clarity, communication apprehension, student motivation, student engagement, diversity, immediacy, and credibility) and affective, cognitive, and behavioral learning outcomes" (p. 203). Their sentiments foreshadowed our own as we contemplated the effect that COVID-19 would have on instructional communication formats, classroom environments, communication practices, and outcomes.

Study 2 was conducted during a major disruption in how we traditionally teach and learn and commenced two semesters after the pandemic that started in 2020 began (Study 2 began in April 2021). In Study 2, traditional course formats (intact and hybrid) were replaced with remote and online learning formats due to the presence of the COVID–19 pandemic. The remote courses featured a combination of synchronous and asynchronous course formats whereas the online courses were entirely asynchronous.

With these goals in mind, we proceeded to examine the impact of the instructional format, classroom climate, student characteristics, and perceived teacher communication and behaviors in regard to students' cognitive learning, communication satisfaction, and students' intent to persist in college in the midst of a global pandemic. Thus, we posed the following research questions for Study 2:

> **RQ3:** What are the similarities and differences between remote and online courses in instructional environment, student characteristics, perceived teacher communication and behaviors, and instructional outcomes?
>
> **RQ4:** What factors predict students' perceived (a) cognitive learning, (b) communication satisfaction, and (c) intent to persist in college by course delivery format (i.e., remote vs. online)?

Method

Participants and Procedures

Study 2 participants were recruited in April 2021 (during the COVID-19 pandemic) from the introductory basic communication course at the same two large Midwestern public universities identified in Study 1. Participants were either enrolled in a remote instructional format (a combination of synchronous and asynchronous teaching) or an online format (asynchronous).

Overall, 335 participants completed the survey and passed the attention check. Among the participants, 216 (64.5%) were from remote courses and 119 (35.5%) from fully online courses. Less than half (42.36%) of the participants had taken an online college course before the COVID-19 outbreak. In addition, 57.9% (n = 194) were female and 42.1% (n = 141) were male, ranging from 18 to 60 years old with a mean age of 19.69 (SD = 4.16). More than half (56.1%, n = 188) were first-year students and 78.5% of the participants (n = 263) reported they were White or Caucasian. The demographic data in Study 1 and 2 were quite similar.

Measurements

Study 2 measured some of the same variables as indicated in Study 1 (see Study 1 for a description of these measures), including instructional outcomes, cognitive learning (α = .873; M = 3.87; SD = .59), student communication satisfaction (α = .932; M = 3.94; SD = .76), and intent to persist in college (α = .982; M = 4.23; SD = .92); connected classroom climate (α = .924; M = 3.53; SD = .57); student characteristics, including communication apprehension (α = .866; M = 3.32; SD = .84); and engagement factors, including oral in-class behaviors (α = .827; M = 3.88; SD = .93), silent in-class behaviors (α = .889; M = 4.00; SD = .76), out-of-class behaviors (α = .765; M = 3.25; SD = .86), and thinking about course content (α = .860; M = 3.92; SD = .77); as well as perceived teacher communication and behaviors, including teacher competence (α = .937; M = 4.48; SD = .68), clarity (α = .937; M = 3.90; SD = .72), and caring (α = .916; M = 4.27; SD = .82).

In addition to the variables measured in Study 1, Study 2 also measured participants' personal risk concerns about the COVID-19 pandemic. Referencing Yang et al. (2014), respondents were asked to indicate their concern about the impact of the pandemic on themselves and their families respectively, on a 5-point Likert-type scale (1 = not at all concerned to 5 = extremely concerned). The mean of these two items operationally defined *personal concern about the pandemic* (r = .551; M = 3.43; SD = 1.15). Moreover, respondents were asked to report whether they were experiencing any of the following living situations during the pandemic, such as having children in the home under the age of 18; seniors who are 65 years old or older; and people with medical conditions (e.g., immune-compromised) living in their home (0 = No, 1 = Yes). An index of *pandemic situations* was created by summing the scores, ranging from 0 to 3 (M = .93, SD = .80).

Furthermore, Schwartzman (2020), noted the disparities students experienced in technology access and skill, two highly salient aspects of success in remote and online learning. To recognize the possible influence of students' receptiveness to technology, we measured informational reception apprehension with technology (IRAT-IT) (Wheeless et al., 2005). Participants were asked to rate each of the 24 statements on a 5-point Likert scale. The mean of these items operationally defined *IRAT-IT* (α = .912; M = 2.68; SD = .59).

Results

To answer *RQ3*, the independent t-tests indicated there were no significant differences between remote and fully online courses across all the variables measured in this study. Consistent with the results of Study 1, students in remote and online courses exhibited similarities in instructional outcomes (cognitive learning: t = .20, p = .84; communication satisfaction: t = .17, p = .87; intent to persist in college: t = 1.27, p = .21; see Table 5); instructional environment (connected classroom: t = 1.46, p = .15); student characteristics (communication apprehension: t = .37, p = .72; silent in-class behaviors: t = 1.45, p = .15; oral in-class behaviors: t = –.19, p = .85; out-of-class behaviors t = –.06, p = .95; thinking about course content: t = –.32, p = .75; perceived teacher communication and behaviors (teacher competence, t = 1.57, p = .12; teacher caring: t = .44, p = .66; teacher clarity t = –.10, p = .92; and IRAT: t = .33, p = .87).

RQ4 asked which factors predicted instructional outcomes for remote and online courses, respectively. Multiple linear regression analyses were calculated to predict perceived cognitive learning for students in remote courses and fully online courses, respectively. For the *remote* courses, a significant regression equation was found (F = 18.74, p < .001) with an R^2 of .526 (adjusted R^2 = .497). Specifically, three factors significantly predicted *cognitive learning* for students in *remote* courses. Thinking about course content was the strongest predictor, followed by teacher caring, and teacher clarity. Table 6 provides a summary of the regression analyses for students' perceived cognitive learning by course format with standardized regression coefficients. For students enrolled in *online* courses, two factors significantly predicted their perceived cognitive learning, including teacher caring and communication apprehension (which was a negative predictor). The regression equation was significant (F = 10.005, p < .001) with an R^2 of .532 (adjusted R^2 = .479).

TABLE 5
Similarities and Differences Between Remote and Online Formats (Study 2)

Variables	Remote		Fully Online		*t*	*p*
	M	*SD*	*M*	*SD*		
Instructional Outcomes						
Cognitive learning	3.87	.58	3.86	.62	.20	.84
Communication satisfaction	3.94	.73	3.93	.81	.17	.87
Persist in college	4.28	.89	4.15	.97	1.27	.21
Instructional Environment						
Connected classroom climate	3.56	.55	3.46	.62	1.46	.15
Student Characteristics						
Communication apprehension	3.34	.87	3.30	.80	.37	.72
Oral in-class behaviors	3.87	.92	3.89	.96	–.19	.85
Silent in-class behaviors	4.05	.74	3.92	.80	1.45	.15
Out-of-class behaviors	3.25	.86	3.26	.87	–.06	.95
Thinking about course content	3.91	.76	3.94	.78	–.32	.75
IRAT	2.69	.56	2.68	.63	.33	.87
Teacher Characteristics						
Teacher competence	4.52	.60	4.39	.79	1.57	.12
Teacher caring	4.28	.78	4.24	.89	.44	.66
Teacher clarity	3.90	.72	3.91	.71	–.10	.92
N = 335 (216 remote instruction format; 119 fully online format)						

TABLE 6
Predictors of Perceived Cognitive Learning by Remote and Online Courses (Study 2)

Predictors	Remote	Online
COVID Impact		
Personal concern about the pandemic	–.033	.014
Pandemic situations	–.047	.056
Instructional Environment		
Connected classroom climate	.044	–.107
Student Characteristics		
Communication apprehension	–.047	**.162***
Oral in-class behaviors	–.056	.148
Silent in-class behaviors	–.003	.094
Out-of-class behaviors	.011	.154
Thinking about course content	**.364*****	.150
IRAT-IT	–.011	–.119
Teacher Characteristics		
Teacher competence	.103	.036
Teacher caring	**.313*****	**.326****
Teacher clarity	**.221*****	.158
Final R^2	**.526**	**.532**
***$p \leq .001$; **$p \leq .01$; *$p \leq .05$		

In terms of communication satisfaction, for the *remote* courses, a significant regression equation was found ($F = 26.88$, $p < .001$) with an R^2 of .614 (adjusted $R^2 = .591$; see Table 7). Two factors significantly predicted communication satisfaction for students in *remote* courses, including teacher caring and teacher clarity. For the *online* courses, a significant regression equation was also found ($F = 21.97$, $p < .001$) with an R^2 of .713 (adjusted $R^2 = .681$). Two factors significantly predicted communication satisfaction for students in an online course. Similar to remote courses, teacher caring was the strongest predictor of communication satisfaction for students enrolled in online courses, followed by teacher clarity.

TABLE 7
Predictors of Communication Satisfaction by Remote and Online Courses (Study 2)

Predictors	Remote	Online
COVID Impact		
Personal concern about the pandemic	.018	.012
Pandemic situations	–0.16	.048
Instructional Environment		
Connected classroom climate	.004	.052
Student Characteristics		
Communication apprehension	–.019	–.097
Oral in-class behaviors	.021	–.106
Silent in-class behaviors	.022	.107
Out-of-class behaviors	–.006	.045
Thinking about course content	.021	–.066
IRAT-IT	–.058	–.006
Teacher Characteristics		
Teacher competence	.099	.067
Teacher caring	**.520*** **	**.602*** **
Teacher clarity	**.271*** **	**.243*** **
Final R^2	**.614**	**.713**

***$p \leq .001$; **$p \leq .01$; *$p \leq .05$

Regarding intent to persist in college, a significant regression equation was found for students enrolled in *remote* courses ($F = 9.23$, $p < .001$) with an R^2 of .353 (adjusted $R^2 = .315$) (see Table 8). Three factors significantly predicted their intent to persist in college. Teacher caring was, again, the strongest predictor, followed by teacher competence, and students' thinking about course content. On the other hand, four factors predicted intent to persist in college for students in *online* courses. Silent in-class behavior was the strongest predictor, followed by teacher caring, oral in-class behaviors (which was a negative predictor), and out-of-class behaviors. The regression equation was significant ($F = 7.89$, $p < .001$) with an R^2 of .472 (adjusted $R^2 = .412$).

TABLE 8
Predictors of Intent to Persist in College by Remote and Online Courses (Study 2)

Predictors		Remote	Online
COVID Impact			
	Personal concern about the pandemic	.006	.028
	Pandemic situations	–.032	–.023
Instructional Environment			
	Connected classroom climate	–.002	.077
Student Characteristics			
	Communication apprehension	–.105	–.099
	Oral in-class behaviors	.027	**–.258***
	Silent in-class behaviors	–.073	**.349****
	Out-of-class behaviors	.046	**.234***
	Thinking about course content	**.160***	.011
	IRAT-IT	.029	–.015
Teacher Characteristics			
	Teacher competence	**.195****	.070
	Teacher caring	.324***	.306**
	Teacher clarity	.126	.028
Final R^2		**.353**	**.451*****

***$p \leq .001$; **$p \leq .01$; *$p \leq .05$

Consistent with the results of Study 1, students in remote and online courses exhibited similarities in instructional outcomes (cognitive learning: $t = .20$, $p = .84$; communication satisfaction: $t = .17$, $p = .87$; intent to persist in college: $t = 1.27$, $p = .21$; see Table 5); instructional environment (connected classroom: $t = 1.46$, p = .15); student characteristics (communication apprehension: $t = .37$, $p = .72$; silent in-class behaviors: $t = 1.45$, $p = .15$; oral in-class behaviors: $t = –.19$, $p = .85$; out-of-class behaviors $t = –.06$, $p = .95$; thinking about course content: $t = –.32$, $p = .75$; IRAT: $t = .33$, $p = .87$; pandemic situations: $t = 1.03$, $p = .31$); perceived teacher communication and behaviors (teacher competence, $t = 1.57$, $p = .12$; teacher caring: $t = .44$, $p = .66$; and teacher clarity $t = –.10$, $p = .92$). The only significant difference found between students in remote and online courses was their *personal concern* about the pandemic ($t = –2.22$, $p = .027$). Students enrolled in an online course were more concerned about the pandemic impact compared to those in a remote course.

Discussion

Considering challenges as opportunities for growth is one of the peculiar benefits of a crisis. This research investigated the explanatory power of instructional formats, classroom environment, student characteristics, and perceived teacher communication and behaviors to predict students' cognitive learning, communication satisfaction, and intent to persist in college in pre-pandemic circumstances and during the pandemic. There are five takeaways from this research. First, and most importantly, we did not find statistically significant differences in instructional outcomes across various course formats. More specifically, we *did not* detect differences between intact and hybrid and remote and online course

formats across all variables measured in this study. Our research illustrates that desired instructional outcomes can be attained regardless of course formats. As Pokhrel and Chhetri (2021) suggested, "There is no one-size-fits-all pedagogy for online learning" (p. 133). Perhaps this generation, the true digital natives (Generation Z), are far more adaptive and flexible and, conceivably, we seem to have reached the point in which, in the words of Fassett and Attay (2022), "no learning . . . must occur entirely in a single modality" (p. 147). Armed with this knowledge, instructors should recognize the relative strengths of the formats to enhance student engagement and learning.

Second, prior to the change in teaching formats (pre-pandemic) and across delivery formats (intact and hybrid), teacher *clarity* was the dominant predictor of students' cognitive learning, communication satisfaction, and students' intent to persist in college. In Study 2 (during the pandemic), teacher *caring* was the prevalent indicator of cognitive learning, communication satisfaction, and students' intent to persist in college across delivery modes (remote and online). Teacher communication and behaviors such as clarity and caring are impactful and appear to play a central role in students' academic successes.

For intact and hybrid courses (Study 1), teacher clarity and student engagement (thinking about course content and silent in-class behavior) assisted students as they cognitively processed, stored, and retrieved information. Regardless of course format, teacher clarity also predicted students' communication satisfaction which is the result of clear interaction between a student and teacher (Goodboy et al., 2009). From the students' perspective, communication satisfaction suggests that they have achieved their goals for satisfactorily interacting with their course instructor.

Student persistence was the result of teacher clarity as well as teacher competence and caring. These findings are consistent with previous research that confirmed that teacher competence has a direct and indirect effect on student persistence (V. E. Wheeless et al., 2011; Witt et al., 2014). Furthermore, having more satisfying interactions with faculty enhances students' persistence to finish college (Tinto, 2012; Witt et al., 2014).

The third important takeaway is that students' engagement in their coursework appears to be highly critical to student success. Our research findings are consistent with Mazer's (2012) claim that student engagement is one of the best predictors of learning. Specifically, we found that *thinking about course content* and *silent in-class behaviors* predicted instructional outcomes in pre-pandemic and pandemic times. When students think about course content and engage in silent in-class behavior, they are involved in the learning process in a profound way. Scale items associated with thinking about course content suggested that students experiencing higher levels of cognitive learning were dedicated to understanding the course materials. They considered how the course information might be utilized in their everyday lives and how it might be useful in their future careers. A high level of engagement signals students' willingness to participate in the learning process. It is clear that students are a driving force in their own cognitive learning, communication satisfaction, and intent to persist in college.

The fourth takeaway, reflective of Study 2, for remote courses, three factors significantly predicted students' cognitive learning and included thinking about course content, teacher caring, and teacher clarity. Conversely, for online courses, teacher caring positively and student communication apprehension negatively predicted cognitive learning. These findings are consistent with previous research that students' communication apprehension interferes with cognitive learning (Byrne et al., 2012).

Teacher caring and teacher clarity were the only significant predictors of communication satisfaction during the pandemic. These results confirmed that students' communication satisfaction with their instructors is critical to the development of the teacher–student relationship. Teaching and learning are relational events. "Put simply, the more students are academically and socially engaged with academic staff, and peers . . . the more likely they are to succeed in the classroom" (Tinto, 2012, p. 5).

For remote course formats, three factors (teacher caring, teacher competence, and thinking about course content) predicted students' intent to persist in college. Regardless of course format (online or remote), two factors significantly predicted students' intent to persist in college including the stronger predictor, students' silent in-class behaviors and teacher competence. Surprisingly, in online courses (Study 2), oral in-class behavior was a significant negative predictor of students' intent to persist in college. In other words, students who participate and freely share their thoughts and opinions with their classmates might be less likely to persist through college. It could be that unlike talking, listening attentively to the lecture and classmates' contributions, and thinking about the course content contributes more meaningfully to persistence toward earning a degree than does a process of sharing thoughts and opinions.

The fifth meaningful takeaway (see Study 2) revealed that the caring factor is a consistent presence for those in the midst of the pandemic. Students experienced problems with internet access, broadband strength, the absence of a quiet place to work without interruption, increased workload, and in some cases anxiety and uncertainty, and the presence of young children and/or siblings quarantined at home (Pokhrel & Chhetri, 2021; Schwartzman, 2020). Students were thrust into a new learning environment with little or no preparation or notice. Contributing to this unease, some students felt a lack of preparedness to meet these new challenges. Students are not equally advantaged, and some do not necessarily have the tools, technical ability, or access to an adequate setting necessary to succeed in an online environment (Sellnow-Richmond et al., 2020).

Even before the pandemic, students were struggling with unprecedented anxiety, depression, and loneliness (Sellnow et al., 2022). The pandemic exacerbated these feelings and compelled teachers to provide students support in unparalleled ways. To navigate these troubling times, Sellnow et al. suggested that instructors practice an *ethic of care*, a theory developed by Carol Gilligan (Gilligan, 1982). Applied to the classroom, this translates into "honoring the burden of a student's lived experience while providing opportunities for them to accomplish rigorous course expectations amid life challenges" (p. 158). To achieve this Sellnow and colleagues (2022) proposed that instructors develop authentic assignments, engage in dialogue that honors students' experiences, and remind them of their inherent worth. Students can still be held to course standards "while [instructors continue] providing opportunities for them to accomplish rigorous course expectations amid life challenges" (p. 159).

Anecdotal information revealed that it was commonplace for faculty to make accommodations for students to ensure their academic survival and success. Faculty members extended themselves selflessly to students in unexpected ways. Teachers were taking more time to listen to student concerns (i.e., caring) and focused on increased messaging (i.e., clarity). Kaufmann and Vallade (2022) advised that enhanced student–teacher communication and connection, the presence of engaged and caring teachers, and clear and organized teaching materials be the standard. It is clear that when faculty extend themselves empathically, students thrive academically and personally. Learning depends on both delivery and content. Thus, it is imperative that we determine the best combination of instructional practices and

pedagogy, as well as student training in various teaching platforms to ensure future student growth and development, long after crises end.

A recent survey concluded that the faculty role expanded during the pandemic to include concern for students' emotional health and well-being. Interim co-director of NSSE, Jillian Kinzie, indicated that "faculty acted as a 'lifeline' for students" because of their unwavering commitment to students (Kleinmann, 2022). Interestingly, caring was less of a prominent predictor in Study 1 as it was in Study 2. This may be explained by the fact that Study 1 data was collected pre-pandemic while Study 2 was conducted during the pandemic. In sum, our data indicated that during the pandemic, students who experienced increased caring from instructors fared better than they would have in the absence of teachers' support. These and other conclusions require additional study. If and when campus life returns to some semblance of normal, the lessons learned from this set of studies could improve student outcomes.

Limitations and Conclusion

While this study provided important insights into understanding how course format, instructional environments, student characteristics, and perceived teacher communication and behaviors predicted instructional outcomes, the results should be viewed in context and with caution. Due to the cross-sectional design of the research, this study did not aim to claim any causal inferences. In addition, self-reported data using a nonprobability sample may have introduced a social desirability bias. Future research should supplement the survey data with behavioral log data or observation and use a longitudinal design. Moreover, this study only examined perceived teacher communication and behavior. Future research is needed to pinpoint teacher behaviors and communication that might impact instructional outcomes across different course formats.

The authors believe that this paragraph is not necessary and doesn't add to our understanding of the topic. We also note the disproportionate number of freshmen in Study 1 (65.7%) as well as in Study 2 (56.1%). While it may be that this demographic influenced the results of these studies, it seemed rather unlikely to the researchers because the average age of the students for both studies (Study 1, 19.08 y.o. with SD = 2.04; Study 2, 19.69 y.o. with SD = 4.16) suggests that they probably all had 12 recent years of pre-college schooling that provided them a rather strong homogenous background in learning environments and formats among themselves.

This study was based on the belief that instructors' and students' communication influences cognitive learning, communication satisfaction, and intent to persist in college. Our findings empirically support these beliefs. Future researchers should confirm these relationships and outcomes to determine whether the changes in the instructional format (in the instance of the two present studies) may have produced anomalous results or perhaps these findings provide a step toward a better understanding of student success in the classroom.

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Appendix

TABLE 9
Correlations for Study 1 Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Learning	–											
2. Communication satisfaction	.610***	–										
3. Persist in college	.429***	.587***	–									
4. Connected classroom climate	.417***	.471***	.355***	–								
5. Communication apprehension	.042	.112*	.098	.159**	–							
6. Oral in-class behaviors	.281***	.376***	.291***	.456***	.245***	–						
7. Silent in-class behaviors	.472***	.474***	.367***	.450***	.040	.473***	–					
8. Out-of-class behaviors	.409***	.311***	.244***	.415***	.038	.379***	.419***	–				
9. Thinking about course content	.493***	.449***	.324***	.471***	.115*	.420***	.395***	.523***	–			
10. Teacher competence	.403***	.569***	.546***	.217***	.040	.206***	.296***	.148**	.197***	–		
11. Teacher caring	.424***	.709***	.565***	.331***	.124*	.235***	.305***	.151**	.299***	.753***	–	
12. Teacher clarity	.557***	.613***	.453***	.380***	.034	.328***	.449***	.339***	.381***	.408***	.476***	–

*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

TABLE 10
Correlations for Study 2 Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Learning	–														
2. Communication satisfaction	.562***	–													
3. Persist in college	.540***	.594***	–												
4. COVID personal concern	.095	.076	.090	–											
5. Pandemic situations	.003	–.054	–.006	.102	–										
6. Connected classroom climate	.375***	.385***	.337***	.097	.055	–									
7. Communication apprehension	–.028	–.079	–.128*	.073	.018	–.187***	–								
8. Oral in-class behaviors	.329***	.277***	.250***	.090	.072	.439***	–.234***	–							
9. Silent in-class behaviors	.412***	.348***	.338***	.084	.072	.500***	–.137*	.640***	–						
10. Out-of-class behaviors	.359***	.212***	.302***	.208***	.018	.383***	–.074	.404***	.538***	–					
11. Thinking about course content	.506***	.252***	.338***	.184***	.045	.374***	–.067	.375***	.492***	.547***	–				
12. IRAT_IT	–.090	–.114*	–.072	–.016	–.097	–.147**	.236***	–.080	–.057	–.024	–.033	–			
13. Teacher competence	.440***	.519***	.428***	.087	–.026	.327***	.048	.230***	.308***	.215***	.245***	–.118*	–		
14. Teacher caring	.525***	.750***	.502***	.057	–.093	.366***	–.025	.246***	.300***	.152**	.192***	–.019	.565***	–	
15. Teacher clarity	.553***	.604***	.431***	.073	.020	.418***	–.022	.357***	.408***	.292***	.382***	–.119*	.392***	.499***	–

*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.