



Pandemic Pedagogy: Elements of Online Supportive Course Design

Nate S. Brophy , Melissa A. Broeckelman-Post , Karin Nordin , Angela D. Miller, Michelle M. Buehl , and Jeff Vomund 

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Abstract: The purpose of this study was to identify which course design elements students perceive as supporting an easier transition to emergency remote teaching due to COVID-19, as well as to use those items to develop the Online Supportive Course Design (OSCD) measure. By asking students to rate their course with the easiest transition and hardest transition to emergency remote teaching, this study identified which structural elements were most important for supporting students during the transition. Using exploratory and confirmatory factor analyses, a seven-item measure was developed to operationalize OSCD, and initial validity was established by examining the relationships between OSCD, autonomy support, and teacher competence. Finally, practical implications for university faculty and areas for future research are discussed.

In the Spring of 2020, COVID-19 caused the partial or entire campus shutdown of over 4,000 institutions of higher education, changing the lives of an estimated 25,000,000 students (Entangled Solutions, 2020). Colleges and universities converted many in-person courses to a remote format, shifting the attention of instructors and administrators to the best practices of “online learning.” However, online learning

Nate S. Brophy, Melissa A. Broeckelman-Post, Karin Nordin, Angela D. Miller, Michelle M. Buehl, and Jeff Vomund, George Mason University, Fairfax, VA

CONTACT: nbrophy@gmu.edu

scholars have been quick to make the distinction between true online learning and what has been labeled “emergency remote teaching” (Hodges et al., 2020). The primary goal of emergency remote teaching is to “provide temporary access to instruction and instructional supports in a manner that is quick to set up and is reliably available during an emergency or crisis” (Hodges et al., 2020, p. 2). The unique circumstances of the pandemic create both an opportunity and necessity to investigate best practices for emergency remote teaching, and this “great experiment” (Zimmerman, 2020, p. 1) could also add to the existing body of research on best practices for online learning.

In the past, universities have occasionally been forced to move to emergency remote teaching following extreme weather crises (Helvie-Mason, 2010), but researchers have not yet investigated or established clear best practices for transitioning courses rapidly from face-to-face (F2F) to fully remote format. Nevertheless, all institutions were forced to do so in response to the COVID-19 pandemic in Spring 2020. Consequently, the first goal of this study is to provide practical advice regarding what students perceived as most helpful and least helpful within emergency remote teaching contexts. Second, this study proposes an Online Supportive Course Design (OSCD) measure to guide faculty in developing their course structures in future emergency situations, as well in intentionally designed online learning experiences.

Online Learning

In the broadest sense, online learning can be defined as “a learner’s interaction with content and/or people via the internet for the purposes of learning” (Means et al., 2014, p. 6). Online learning is a subset of distance learning, which includes any learning that occurs when instructor and student are physically separated, whether or not those courses are delivered using internet-based formats (Means et al., 2014). In the past, online learning typically occurred in a fully online format where all instruction and assessment are delivered asynchronously via the internet or in a hybrid (a.k.a. blended) format incorporating a mix of asynchronous online and F2F meetings (Means et al., 2014). When institutions made a rapid emergency shift to remote teaching in the Spring of 2020, however, several additional formats were introduced. Some institutions also experimented with *HyFlex* and *BlendFlex* models, which involved having some students simultaneously attend classes in a mix of in-person, synchronous online, and asynchronous online formats, with a limit on the number of students who could attend in person each day (Lieberman, 2018; Miller et al., 2021). Many others taught courses synchronously online using videoconferencing tools such as Zoom, which is substantially different from the asynchronous online teaching featured in most previous research about online courses.

The emergency transition to remote teaching due to COVID-19 was an unprecedented rapid shift in teaching and learning that utilized the deployment of instructional strategies and tools that had not been previously tested or even available on a broad scale; therefore, it’s vital to study this form of online teaching as discrete from intentionally planned online courses. However, previous research about online courses provides a framework for thinking about the key factors influencing success in emergency remote teaching contexts.

Money and Dean (2019) synthesized 10 years of online learning research and propose the following model for understanding what contributes to success in an online setting. More specifically, the model describes individual factors (demographics, technology preferences, etc.) and course design factors.

Individual Factors

Traditional online courses often attract a student population with different needs than F2F courses. Students who choose online courses often do so because they need greater flexibility due to other constraints (e.g., adult learners with full-time jobs, caregiver responsibilities, geographic constraints, economic disparities; Mather & Sarkans, 2018). Students who are successful in online contexts typically have strong communication and technical skills, are self-directed learners with an internal locus of control, and have strong time-management skills and an ability to work independently (Dabbagh, 2007; Driscoll et al., 2012; Goodman et al., 2019; Hoppes et al., 2020; NCES, 2018; Ortagus, 2017). This complex set of characteristics and circumstances impact what this population of learners needs and prefers in an online learning environment (Panacci, 2017). Specifically, students who intentionally choose online courses due to this complex array of constraints are more likely to pass asynchronous courses (Faulconer et al., 2018) and often worry about the time constraints associated with in-person courses (Stewart et al., 2010).

In contrast, many of the students who shifted from in-person to emergency remote classes were residential students who had intentionally chosen the structure and experience of F2F classes. Consequently, they would likely be developing the time-management, organizational, and self-directed learning skills needed for online learning success while taking the courses. Individuals whose education was unexpectedly shifted to a fully-online format by extrinsic circumstances constitute a different population of students; it would therefore be misguided to assume that the course design structures that worked well for previous online learners will be the same ones that will facilitate success during emergency transitions to remote teaching. Past studies have shown that on-campus student populations are more likely to withdraw from online courses than F2F courses (Murphy & Stewart, 2017), perform worse in online courses than F2F courses with the same content (Fischer et al., 2020), are less likely to be successful as they take larger online course loads (Glazier et al., 2020), and are more satisfied with synchronous course lectures than asynchronous lectures (Simonds & Brock, 2014).

Course Design

Although it is important for faculty to be aware that students in courses experiencing an emergency transition from F2F to remote teaching have different needs and characteristics than students who typically choose fully online courses; course design and instructor-student interactions are the areas where faculty have the greatest potential to impact learning success. Jaggars and Xu (2016) identified four course factors that contributed to student success in online courses: organization and presentation, learning objectives and assessments, interpersonal interaction, and use of technology. Of those factors, course grades were only meaningfully predicted by interpersonal interaction, which included elements such as regular announcements, a quick response time, and a sense of care (Jaggars & Xu, 2016).

Although instructional communication research about online teaching is somewhat limited (Chatham-Carpenter, 2017), previous communication research in online learning contexts indicates that instructor interaction matters. Teacher misbehaviors unique to the online learning context include ineffective and inconsistent communication, as well as lack of engagement from the instructor (Vallade & Kaufmann, 2018). Similarly, student perceptions of instructor immediacy, communication satisfaction, and task-related interpersonal attraction negatively predict perceptions of teacher misbehaviors (Hazel et al., 2014), and online nonverbal immediacy behaviors are associated with higher course engagement (Dixon et al., 2017). The use of videos for announcements and assignment feedback can increase perceptions of instructor immediacy (Bialowas & Steimel, 2019). Furthermore, Kaufmann et al. (2016) developed

an online learning climate scale comprised of factors for instructor behaviors, course structure, course clarity, and student connectedness that help to generate a positive online classroom climate.

The evidence on instructor-student interactions in online courses ties into the larger theoretical background on social presence. Social presence is the degree to which a person is perceived as “real” in mediated communication and has a significant impact on student satisfaction and perceptions of student learning (Richardson et al., 2017). More specifically, instructor presence, which is the verbal and non-verbal cues that make up the “virtual visibility” of the instructor, also predicts student success (Chakraborty & Nafukho, 2015). Instructor presence can be conceptualized as the online equivalent of teacher immediacy (Chakraborty & Nafukho, 2015). Not only does instructor presence increase student satisfaction and course ratings, but it also increases self-reported perceptions of cognitive and affective learning (Baker, 2004).

As previously mentioned, because the students who were learning via emergency remote teaching are a different population than those who have typically elected to take online courses, it would be unwise to assume that past research on online learning is directly applicable to remote emergency instruction. To prepare for potential scenarios in which universities face another rapid shift to the emergency transition to remote teaching (e.g., pandemics, natural disasters), it is important to identify which course design elements facilitated an easier or harder transition to learning online. Consequently, we pose the following research questions:

RQ1: Which format do students prefer for emergency remote teaching

RQ2: Which course design elements are associated with an easier or harder transition to emergency remote teaching?

RQ3: Do the individual course design elements work together as indicators to form a scale or subscales operationalizing online supportive course design in emergency remote teaching contexts?

Self-Determination Theory

Self-determination theory (SDT) posits that there are three underlying psychological needs that influence students’ overall motivation and academic performance: autonomy (ownership of one’s action), competence (a feeling of mastery), and relatedness (a sense of belonging; Ryan & Deci, 2000, 2020). Instructors can facilitate the satisfaction of these needs by creating learning environments that provide autonomy support and structure (Ryan & Deci, 2020). In classroom settings, perceived autonomy support predicts ratings of teaching effectiveness and course design effectiveness (Demir et al., 2019); however, autonomy support tends to be lower in online classes (Filak & Nicolini, 2018). Autonomy support may be particularly important in the context of emergency remote teaching when student autonomy is being limited by the cause of the emergency remote teaching (e.g., COVID-19). Moreover, as Ryan and Deci (2020) note, “When teachers are autonomy supportive, they are typically also supportive of students’ other basic psychological needs (competence and relatedness) as well” (p. 4). Student perceptions of autonomy support have been correlated with greater levels of intrinsic motivation (Jang et al., 2010), engagement (Patall et al., 2018), and interest (Tsai et al., 2008). Given these important associations with students’ adaptive classroom behaviors, the research team believes autonomy support could be a critical factor in the development of an effective online supportive course design.

Teacher Competence

Similarly, students' perceptions of teacher competence may be a vital factor in an online supportive course design. The move to emergency remote teaching caused by COVID-19 required teachers not only to have the knowledge and skills needed for effective instruction, but also to display confidence in successfully using those skills online (König et al., 2020). Originating from McCroskey (1992) as a dimension of teacher credibility, teacher competence includes knowledge or expertise in a certain area, but also includes the ability to explain complex material well, practice effective classroom management behaviors, and proficient communication skills (Teven & Hanson, 2004). Previous studies have found that students' perceptions of teacher competence predicted students' classroom experience, behavior, and outcomes, including motivation (Gorham & Christophel, 1992) and achievement (Akram, 2019), as well as cheating (Murdock et al., 2004) and self-reported misbehavior (Bru et al., 2002).

Since autonomy support and teacher competence are both associated with effective teaching and positive learning outcomes—and may be particularly important in the switch to an emergency remote teaching context—we would expect them to be positively correlated with a supportive online course design, so these variables can help to establish convergent validity. Additionally, there should be differences between these variables for courses that made more versus less successful transitions to emergency remote teaching (concurrent validity), so we pose the following hypotheses:

H1: Supportive online course design will be positively correlated with perceived autonomy support and perceived teacher competency.

H2: There is a difference in perceived autonomy support in courses that students perceive as having an easier versus a harder transition to emergency remote teaching.

H3: There is a difference in perceived teacher competency in courses that students perceive as having an easier versus a harder transition to emergency remote teaching.

H4: There is a difference in supportive online course design in courses that students perceive as having an easier versus a harder transition to emergency remote teaching.

Method

Procedures

This study was conducted at a large, diverse mid-Atlantic public university during the Spring 2020 semester. When the COVID-19 crisis reached the U.S., the university extended Spring break by a week to give instructors time to transition to remote teachings, and the remainder of the semester was taught exclusively online. Students enrolled in either of the undergraduate introductory communication courses that met the general education requirement for oral communication (COMM 100: Public Speaking or COMM 101: Fundamentals of Communication) and were asked to complete an online pre-course survey for course credit during the first 2 weeks of the semester, and only the demographic data from that survey was included in this analysis. The post-course survey, which was completely redesigned after the emergency transition to remote teaching, was completed during the last 2 weeks of the Spring semester for course credit, and collected all non-demographic data reported in this study. If a student did not wish to participate in the study, they were able to indicate that within the survey and their data

was removed prior to analysis, per IRB-approved procedures. Students who failed attention checks in the survey were also removed from the data set prior to analysis.

Participants

Participants included 1,203 undergraduate students. Of these students, 935 shared demographic data in the pre-course survey, 45% of whom were female and 55% of whom were male. The average age of participants was 19.75 years ($SD = 3.25$). Most of the students were freshmen (56.8%), followed by sophomores (25.9%), juniors (10.3%), and seniors (6.7%). Students were asked to report their race/ethnicity and could indicate more than one response. The sample was 42.6% White, 32.3% Asian, 15.3% Black, 13.4% Hispanic, 6% Middle Eastern or North African, and 1.1% Pacific Islander. Of the students who responded to the post-course survey, 38% reported that they had taken a fully online course before this semester, and 62% reported that they had not previously taken an online course.

Measures

Student Preference

Students were asked about their preferences for future course format through two questions. First, students were asked, “Do you plan to take fully online courses in the future?” Next, to find out which format students preferred specifically for their communication course, students were asked, “Which format of your COMM 100/101 class do you believe would be most effective for a fully online version of the class?”

Easiest Versus Hardest Course Transitions

At the beginning of the survey, participants were given the following prompts:

1. Think about all of the classes that transitioned to a fully online format halfway through the semester as a response to COVID-19. Which of your classes had the easiest or most successful online transition for you as a student?
2. Which of your classes had the hardest or most difficult online transition for you as a student?

After identifying the courses that they perceived to have the easiest transition (ET) and the hardest transition (HT), those course numbers were pre-populated in the survey for each of the following measures, and students were asked to respond to each item side by side, once for their course with the ET, and once for the course with the HT, which allowed for a gap analysis.

Online Supportive Course Design

In order to identify whether there were structural elements that students perceived as being more supportive of learning during the transition to emergency remote teaching, the research team generated 16 items that described structural course elements that might impact the ease with which students might adjust to emergency remote teaching. Given that the COVID-19 transition happened so close to the end of the semester, there was not time to collect qualitative responses to generate items used in this survey (similar to the approach used by Goodboy & Myers, 2015), so these items were developed based on

researchers' experience teaching online, previous research on online course design (included that cited earlier in this paper), recommendations that had been shared by the university's teaching and learning center, and anecdotal comments from students about what was and was not working for them across their course transitions. Students responded to each item on a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. Example items included, "I was given clear instructions for what I needed to do," and, "I had weekly deadlines that helped me stay on track" (see Table 1 for all items). For the first part of the analysis, each item is being treated as an individual course design element, so an overall reliability measure for the full set of items was not appropriate.

Perceived Autonomy Support

Students' perceived autonomy support was measured for students ET and HT using a shortened six-item version of the Learning Climate Questionnaire (LCQ; Center for Self-Determination Theory, n.d.; see also Williams & Deci, 1996). The shortened LCQ contained items such as, "I feel that my instructor provides me choices and options," and, "My instructor conveyed confidence in my ability to do well in the course." The ET LCQ items had a reliability of $\alpha = .87$, while the HT LCQ items had a reliability of $\alpha = .90$.

Teacher Competency

Teacher competency was assessed using a nine-item scale developed by Murdock et al. (2001), who reported a reliability of $\alpha = .78$. The teacher competency measure contained items such as, "The instructor's presentation of the material is well organized," and, "My instructor is well prepared for class." In the present study, the ET teacher competency items had a reliability of $\alpha = .92$, while the HT teacher competency items had a reliability of $\alpha = .94$.

Results

Student Preference

To answer RQ1, a frequency analysis was conducted on the two student preference questions. When asked whether the student planned to take fully online courses in the future, 17.4% of students responded, "Definitely"; 37.2% responded, "Maybe—if the courses I need are offered online at more convenient times than in-person classes"; 33.66% responded, "Maybe—if it is the only way that I can take the classes I need"; and 11.8% responded, "Definitely not." These results suggest that most students are open to taking online courses after experiencing emergency remote teaching, particularly if the online options are convenient.

The primary introductory communication course (COMM 101) in which this study was conducted is typically taught in a lecture-lab format in which the equivalent of 1 credit hour of content is taught asynchronously online, and students meet in the classroom for 2 hours each week. When asked which format would be most effective for a fully online course, 32.8% of participants indicated that they would prefer a fully asynchronous course with no set meeting times, and 67.2% indicated that they would prefer a partially synchronous class in which students would do some work on their own and would also meet with their entire class online during the normal lab time.

Analysis of Individual Course Design Items

In order to identify which course design elements facilitated easier and harder transitions to emergency remote teaching due to the COVID-19 outbreak (RQ2), a series of paired-samples *t*-tests were conducted for each item. Since Shapiro-Wilk tests for normality are designed for samples between 20 and 50 (D'Agostino, 1971), making it overly sensitive to large sample sizes (Meyers et al., 2016), skewness and kurtosis were visually examined for the individual items to ensure that the data met the assumption of normal distribution; none were found to be too skewed or kurtotic using conservative standards. To account for familywise inflation of alpha since a total of 16 *t*-tests were conducted, a Bonferroni correction was applied to lower the alpha threshold for statistical significance from the standard .05 to .003125 (.05/16 = .003125).¹ Additionally, the within-subjects effect size, Cohen's d_z (1988, 1992; see also Fritz et al., 2012), was computed in order to determine the magnitude of the difference between reported ET and HT.²

Results indicated that there were significant differences between the ET and HT course for all 16 items. Table 1 on the following page shows the means, standard deviations, mean differences, and effect sizes for all items, sorted in order from largest to smallest effect size.

Notably, students were far more likely to perceive that they were able to learn as much in their online course as they would have in-person in their courses with the ET than those with the HT. Some of the design elements that were most strongly associated with an easier transition included clear instructions, flexibility, having access to materials, having everything needed for the class in Blackboard, and regular feedback and reminders from instructors. Some of the elements that were most strongly associated with a harder transition included requiring more work online, changing assignments as a result of the transition, and lack of clarity about how to find and submit assignments.

Online Supportive Course Design Scale

Exploratory and confirmatory factor analyses were conducted to evaluate whether the individual online course design items constituted a global measure of online supportive course design (RQ3). First, all participants in the dataset ($N = 857$) who completed all 16 items for both the ET and HT contexts were randomly split into two data sets in order to conduct an EFA on the first half and then confirm the factor structure with CFA on the second half.

Using the first half data set ($N = 431$), two EFAs were conducted to determine the underlying factor structure. Principal axis factoring using promax rotation was used to identify factors and eliminate survey items that did not adequately load onto a factor. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was $> .5$ for both solutions (.827 for ET, .895 for HT), and Bartlett's Test of Sphericity was significant for both solutions ($p < .001$), indicating the data met the assumptions necessary for factor analysis. Factors with eigenvalues greater than 1.00 and depicted above the bend in a visual inspection of the scree plot were considered. Both tests had three factors with eigenvalues greater than 1, but the scree plots indicated that there were likely only one or two factors present.

1. A Bonferroni correction is the purposeful lowering of the alpha threshold for significance to mitigate Type I errors by dividing the standard alpha threshold ($\alpha < .05$) by the number of tests conducted. A discussion on the necessity of this correction is outside the purview of the present study; instead, see Frane (2015) and McEwan (2017).

2. Commonly-used criteria for interpreting Cohen's (1988) d include $d = 0.2$ as small, $d = 0.5$ as medium, and $d = 0.8$ as large effect sizes. For more contemporary explanations of Cohen's d and its application, see Cumming (2013) and Fritz et al. (2012).

TABLE 1
Results of Gap Paired-Samples T-Tests, With Mean Differences, Inter-Item Correlations, and Effect Sizes

	Easiest Transition	Hardest Transition	Mean Difference	Inter-Item Correlation	Effect Size
Item	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>r</i>	<i>d_z</i>
1. I was able to learn as much in my online class as I would have in a campus classroom	3.86 (1.21)	2.32 (1.25)	1.54 (1.53)***	.23***	1.00
2. I have done well in this class after the online transition.	4.32 (0.85)	2.93 (1.26)	1.39 (1.39)***	.11***	1.00
3. I was given clear instructions for what I needed to do.	4.52 (0.68)	3.34 (1.28)	1.18 (1.30)***	.12***	0.86
4. My instructor gave me the flexibility that I needed to complete my work.	4.37 (0.88)	3.26 (1.34)	1.11 (1.53)***	.10**	0.73
5. I had the materials that I needed to do the work in this class.	4.52 (0.72)	3.59 (1.22)	0.93 (1.30)***	.18***	0.71
6. My instructor put everything that we needed for class in Blackboard.	4.58 (0.71)	3.66 (1.25)	0.92 (1.37)***	.11**	0.67
7. This class required a lot more work online than it would have in the classroom.	2.48 (1.22)	3.51 (1.33)	-1.03 (1.66)***	.15***	0.62
8. I received feedback on my work on a regular basis.	3.96 (1.08)	2.94 (1.36)	1.02 (1.67)***	.08*	0.62
9. My instructor sent regular reminders about what we needed to do.	4.35 (0.90)	3.45 (1.33)	0.90 (1.52)***	.12***	0.59
10. My instructor was available for me if I had questions or needed to talk.	4.48 (0.75)	3.69 (1.23)	0.79 (1.37)***	.12**	0.58
11. I had weekly deadlines that helped me stay on track.	4.30 (0.92)	3.57 (1.27)	0.73 (1.43)***	.18***	0.51
12. I did not know how to find or submit my assignments online.	1.67 (1.06)	2.32 (1.32)	-0.65 (1.34)***	.38***	0.49
13. I participated in discussion boards.	3.73 (1.31)	3.07 (1.34)	0.66 (1.72)***	.16***	0.39
14. The assignments in this class changed a lot after the online transition.	2.57 (1.37)	3.24 (1.37)	-0.67 (1.94)***	.01	0.35
15. There were online lectures or learning modules built into the course.	4.10 (1.21)	3.51 (1.41)	0.59 (1.79)***	.08*	0.33
16. I worked with other students on collaborative assignments (group projects, peer workshops, etc.).	3.27 (1.53)	2.96 (1.54)	0.31 (2.17)***	.00	0.14

Note. $N = 857$. This table is organized in descending order by within-subjects effect size (d_z)—see Cohen (1988, pp. 48–52) and Faul et al. (2007) for detailed explications of d_z .

* $p < .05$, ** $p < .01$, *** $p < .001$

For each EFA on the ET and HT items, pairs of items that were not correlated with any other item at $r \geq .3$ and/or were non-significant were excluded from further analyses, as they were deemed not factorable (Tabachnick & Fidell, 2019). Moreover, throughout the EFA process, only items with loadings on the rotated pattern matrix above .32 were examined. While no universal standards exist pertaining to item retention, items were retained on a given factor following Tabachnick and Fidell's guidelines for interpreting rotated factor loadings; echoing Comrey and Lee (1992), the authors forward that a cutoff of .45 (20% overlapping variance) on the primary factor as considered "fair." Items were omitted individually during the EFA process if they cross-loaded on more than one factor. A final consideration for item retention was conceptual in nature. For example, the item "I was doing well in this class before the online transition" was excluded, as it pertained solely to the COVID-related mid-semester shift to online learning—thus, limiting its utility in other contexts and potentially hindering the heuristic of the nascent scale.

In the randomly selected bifurcated data ($N = 431$), the same seven items loaded onto a single factor in both contexts, explaining 39.64% of the variance in the ET context and 53.70% of the variance in the HT context, respectively. Table 2 provides the item loadings for the single factor identified in both the ET and HT contexts, as well as the means, standard deviations, and scale reliabilities. These items were focused on the design of and communication in the course, so this scale was titled the Online Supportive Course Design Measure (OSCD).

The remaining 426 randomly-selected cases were used in two maximum likelihood estimation CFAs. The first CFA examined the unidimensionality of items responding to the participants' easiest transition, while the second evaluated items pertaining to their hardest transition. Goodness of fit was assessed in concordance with the guidelines for assessing global model fit proposed by Brown (2015; see also Hu & Bentler, 1999). Given that chi-square tests are overly sensitive to sample size, other indices were used to assess model fit (viz., SRMR, RMSEA, CFI, TLI; Brown, 2015; Kline, 2016). Specifically,

support for contentions of reasonably good fit between the target model and the observed data (assuming ML estimation) is obtained in instances where (1) SRMR values are close to .08 or below; (2) RMSEA values are close to .06 or below; and (3) CFI and TLI values are close to .95 or greater. (Brown, 2015, p. 74)

The CFAs were conducted using the lavaan package (Rosseel, 2012) in R (R Core Team, 2020; RStudio Team, 2020).

For the seven ET items, the model fit was good, $\chi^2(14) = 32.31$, $p = .004$, SRMR = .036, RMSEA = .055 90% CI [.030; .081], CFI = .97, TLI = .95. The seven HT items also indicated good fit on a single latent variable, $\chi^2(14) = 35.67$, $p = .001$, SRMR = .031, RMSEA = .060 90% CI [.036, .085], CFI = .98, TLI = .97. Table 2 contains the standardized factor loadings for both the ET and HT items, all of which were significant at $p < .001$.

TABLE 2
OSCD Measure: Descriptive Statistics, EFA Loadings, CFA Standardized Loadings, and Cronbach's Alpha Coefficients

Item	Easiest Transition			Hardest Transition		
	Full Data Set	EFA	CFA	Full Data Set	EFA	CFA
	<i>M (SD)</i>	Factor Loadings	Standardized Loading	<i>M (SD)</i>	Factor Loadings	Standardized Loading
I was given clear instructions for what I needed to do.	4.52 (0.68)	0.62	0.66	3.34 (1.28)	0.71	0.75
My instructor gave me the flexibility that I needed to complete my work.	4.37 (0.88)	0.47	0.54	3.26 (1.34)	0.59	0.66
My instructor put everything that we needed for class in Blackboard.	4.58 (0.71)	0.56	0.55	3.66 (1.25)	0.73	0.62
I received feedback on my work on a regular basis.	3.96 (1.08)	0.49	0.52	2.94 (1.36)	0.68	0.64
My instructor sent regular reminders about what we needed to do.	4.35 (0.90)	0.53	0.55	3.45 (1.33)	0.72	0.73
My instructor was available for me if I had questions or needed to talk.	4.48 (0.75)	0.64	0.62	3.69 (1.23)	0.75	0.71
I had weekly deadlines that helped me stay on track.	4.30 (0.92)	0.49	0.48	3.57 (1.27)	0.57	0.60
Scale Descriptive Statistics	4.36 (0.53)	—	—	3.41 (0.94)	—	—
Scale Reliability	$\alpha = .74$	$\alpha = .73$	$\alpha = .75$	$\alpha = .85$	$\alpha = .85$	$\alpha = .85$

Note. Given the different loadings in ET and HT contexts, the items in Table 2 are listed congruent to their order in Table 1. All means and standard deviations were calculated from the full data set ($N = 857$). The full data set was randomly split into two files. Exploratory factor analyses on half of the cases ($N = 431$) were used to determine the factor structure of the items in ET and HT contexts; in both contexts, the analyses yielded the same seven items loading onto a single factor labeled online supportive course design (OSCD). Subsequently, confirmatory factor analyses (CFA; $N = 426$) were conducted on the remaining bifurcated data to examine the validity of the *a priori* measure of OSCD. All standardized loadings are significant at $p < .001$; goodness of fit indices for the CFAs are reported in-text.

Associations With Autonomy Support and Teacher Competence

To test H1, correlation analyses were conducted to evaluate whether supportive online course design was significantly related to perceived autonomy support and perceived teacher competence. As is shown in Table 3, strong positive correlations were found among all of the variables at the $p < .001$ level. H1 was supported.

Variables	Easiest Transition		Hardest Transition		Correlations		
	α	$M (SD)$	α	$M (SD)$	1	2	3
1. Perceived Autonomy Support	.87	4.06 (0.72)	.90	3.25 (0.96)	—	.80*	.74*
2. Teacher Competency	.92	4.37 (0.60)	.94	3.55 (0.98)	.74*	—	.77*
3. Online Supportive Course Design	.74	4.36 (0.54)	.85	3.41 (0.94)	.58*	.60*	—

Note. $N = 857$. Correlations below the diagonal bars are the easiest transition correlations, those above are the hardest transition correlations.

* $p < .001$.

Next, to test H2–H4, a within-subjects MANOVA was conducted to determine if there were significant differences between mean ET and HT scores on the perceived autonomy support, teacher competency, and online course design measures.

A visual examination of histograms and Q-Q plots for the DVs, as well as their standardized residuals following the within-subjects MANOVA model, indicated univariate and multivariate negative skew resulting in non-normal distributions. This negative skew was likely a consequence of the highest option on the Likert-scale, five, being the most frequent mean score for all the ET DVs—perceived autonomy support (17.5%), teacher competency (22.8%), and OSCD dependent variables (17.4%)—a trend which was not true for the HT DVs. In other words, for each ET DV, a sizeable portion of the sample (roughly one fifth) responded by rating their instructors with all fives on the five-point Likert scale. Consequently, the maximum mean score of five for each construct was more frequent than one might expect when surveying a population of this size.

Notably, the survey contained a series of attention checks, and only those students who passed these attention checks were included in the analyses. Therefore, we concluded that these scores are indicative of students' true responses to the scale items and not outliers. Instead, this may be an instance of a ceiling effect for the ET DVs (Cramer & Howitt, 2004); where students perceived their instructors as scoring high on the ET measures, but the bounds of the scales (1–5) limited the amount of variance that could be captured when examining higher scores. Consequently, as a result of these violations, the Pillai's Trace value is reported for the overall within-subjects effect, as it is more robust to these violations (Olson, 1974).

The omnibus within-subjects MANOVA was statistically significant, Pillai's Trace = .47, $F(3, 854) = 252.65$, $p < .001$, $\eta_p^2 = .47$. Means with standard deviations are reported in Table 3. Univariate follow-up tests examining the differences between ET and HT found significantly higher mean ET scores for all three dependent variables. For the measure of perceived autonomy support, $F(1, 856) = 460.25$, $p < .001$, $\eta_p^2 = .35$; post hoc pairwise comparisons indicated that ET had a statistically significant higher

mean score than HT, $M_{diff} = 0.81$, $SE = .04$, 95% CI [0.74, 0.89]. Similarly, the univariate within-subjects comparison of the teacher competency variable was statistically significant, $F(1, 856) = 524.28$, $p < .001$, $\eta_p^2 = .38$; with students reporting significantly higher mean scores for their ET course compared to their HT course, $M_{diff} = 0.82$, $SE = .04$, 95% CI [0.75, 0.89]. Finally, the univariate within-subjects test for the novel OSCD measure was statistically significant, $F(1, 856) = 727.13$, $p < .001$, $\eta_p^2 = .46$; again, students reported higher mean scores for their ET course compared to their HT course, $M_{diff} = 0.95$, $SE = .04$, $p < .001$, 95% CI [0.88, 1.02].

In sum, the newly-positied OSCD measure was significantly positively correlated with the perceived autonomy support and teacher competency scales in both the ET course and HT course contexts. Additionally, results showed that ET courses had stronger levels of autonomy support, teacher competency, and OSCD than HT courses, thus H2–H4 were supported.

Discussion

While individual faculty members or universities have occasionally had to make short-term transitions to emergency remote teaching in the past, the transition that occurred in Spring 2020 was an unprecedented large-scale shift in learning. The goal of this study was to find out what types of course design elements worked well for students as a starting point for future research about effective emergency remote teaching as well as online education.

Student Preferences

Despite widespread concerns that students would not attend or return to college if courses were offered online in Fall 2020, the results of this study suggest that most students are open to taking courses online, particularly if online courses are offered at convenient times or if online courses are the only way to complete needed coursework. However, previous assumptions that online courses must be offered asynchronously do not hold up during transitions to emergency remote teaching. Whereas students who typically enrolled in online courses in the past were more likely to be parents, work full-time jobs, or have other responsibilities and economic constraints that made the flexibility of asynchronous courses attractive (Mather & Sarkans, 2018; Panacci, 2017; Stewart et al., 2010), students who were enrolled in F2F courses that transitioned rapidly to remote teaching had a different set of constraints and preferences. Many on-campus students who choose F2F classes thrive in environments that provide structure and social interaction, which might explain why more than two thirds of the participants in this study indicated that they believed that a partially synchronous format for the introductory communication course would be more effective for future students. While providing at least some asynchronous course options is important to ensure access for students with limited internet and technology resources at home, these results suggest that it is also important to provide synchronous learning opportunities to support students who benefit from the structure and social support offered by course meetings.

Even after the COVID-19 pandemic has passed and universities are able to transition away from emergency remote teaching, universities that have fully online programs should consider offering synchronous online courses along with the asynchronous course offerings that have been more typically offered in fully online programs. Further, when F2F courses can be resumed safely, our results indicate that students prefer the flexibility of both partially asynchronous content as well as the possibility of participating in virtual interactivity. As a practical matter, students' responses during this transition to emergency remote teaching suggests that the stark choice between courses offered as either fully-F2F or

fully-asynchronous online may be waning—with students expecting, and universities offering, a much more creative mix of asynchronous, synchronous, and F2F learning.

Individual Course Design Items

The present study asked students about their courses that had the easiest transition (ET) and hardest transition (HT) to emergency remote teaching; as a result of this survey design, a wide range of student experiences from diverse disciplines from across the university were aggregated and analyzed. The elements that seemed to have the strongest effect size for helping courses have an easier transition—clear instructions, flexibility, having access to materials, having everything needed for the class in Blackboard, and regular instructor feedback and reminders—seem to be related primarily to process clarity (Titsworth & Mazer, 2010). The elements that were associated with a harder transition—requiring more work online, changing assignments, and lack of clarity about how to find and submit assignments—seem to be associated with greater uncertainty and unpredictability. However, the specific types of engagement in the course (discussion boards, online lectures, learning modules, collaborative assignments) had much lower effect sizes and were less influential in determining whether the transition to remote teaching was smooth. When designing courses for emergency remote contexts in the future, the items in this scale can be used as a checklist to remind instructors to be intentional about including structural elements that facilitate an easier remote transition for students. Additionally, these items might also provide a useful starting point for developing measures for online instructor clarity.

Furthermore, the findings of the present study underscore the importance of instructor communication behaviors and highlight the value that instructional communication scholars can bring to conversations about how to effectively transition courses to emergency remote teaching when the need arises. Just as prior research about online learning does not necessarily translate to emergency remote teaching, it would be similarly ill-advised to assume that instructor communication variables will function the same way in online learning environments as they do in F2F classes. Some instructional communication scholars have already started to evaluate how to most effectively teach communication skills online (e.g., Broeckelman-Post et al., 2019, 2020; Westwick et al., 2018, 2015, 2016) and evaluate how instructional communication variables function in online courses (e.g., Dixon et al., 2017; Hazel et al., 2014; Kaufmann et al., 2016; Vallade & Kaufmann, 2018) in intentionally designed online courses. Even so, as several other scholars have argued in the past year, this is an area ripe for future research and our scholarship about online teaching and learning needs to extend to include both online and emergency remote contexts (Miller et al., 2021; Morreale et al., 2021; Prentiss, 2021; Westwick & Morreale, 2021).

Practically speaking, our findings suggest that when instructors intentionally design an online course or move to an online context, they should prioritize matters of communication clarity and student convenience. For instance, instructors could email or text direct links to course content to students as opposed to having them find the link on a virtual website (e.g., Blackboard or Canvas). Instructors might even couple written instruction with recorded video or audio instruction, thus providing students with an additional mode of communication that may help their comprehension and retention of instructions.

Online Supportive Course Design

The development of the Online Supportive Course Design measure as part of this study is a first step in beginning to develop research tools that can be used to further explore what works in online learning

contexts. The positive relationships that were found between OSCD, autonomy support, and teacher competency provide initial evidence establishing convergent validity of the scale; while the significant differences that were found between the ET and HT classes suggest that this measure has concurrent validity. Furthermore, this analysis addresses and supports many of the conclusions drawn by Money and Dean (2019) in their review of effective online education. For instance, the authors posit that effective online instructional processes may offer learners greater control over their own learning or be particularly mindful of learner perceptions of practical needs dovetails with our finding that autonomy supportive processes correlated positively with students' experiencing an easier transition to an online environment (Money & Dean, 2019). Furthermore, our finding that teacher clarity was an important component in the perceived ease of transition to online learning adds evidence to Money and Dean's assertion that online instructors must be effective facilitators. In an online setting, instructors must guide students through new content as well as a virtual learning environment; thus, they may well have to spend more time supporting students' navigation of the environment itself.

Even with the foregoing evidence, future research is needed to affirm the validity of these findings in other contexts—including both emergency remote contexts and online learning contexts, as well as in universities where students do and do not have prior online learning experience. Additionally, future research should evaluate the extent to which this scale is correlated with various dimensions of other instructional communication scales developed for use specifically in online contexts, such as the Online Learning Climate Scale (Kaufmann et al., 2016).

Conclusion

This study identified several course structure elements that facilitated easier transitions to emergency remote teaching, as well as several that made such a transition more difficult. By developing the OSCD measure, this study is a first step that can provide practical support for university administrators and faculty who are in the midst of emergency remote transitions, while also potentially demonstrating utility in developing more effective online courses in nonemergency contexts.

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