

The effects of unexpected changes to content delivery on student learning outcomes: A psychological contract perspective during the COVID-19 era

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Abstract

Meta-analyses suggest that student learning outcomes (SLOs) are comparable across modalities of instruction. None of these studies examined how unmet student expectations (here, unexpected changes in course delivery) might increase perceptions of student-instructor-university psychological contract breaches (PCBs) and, ultimately, perceived SLOs within and across modalities. The COVID-19 pandemic provided an opportunity to study these potential relationships because many residential institutions of higher education opted into, or were required to, offer distance and/or blended learning to accommodate COVID-19 safety mandates. This study sampled undergraduate students ($n = 155$) from a university, which, before the pandemic, offered exclusively face-to-face classroom instruction. During the Fall 2020 semester, however, this university offered three modalities of instruction: (1) face-to-face; (2) blended learning; and (3) distance education. The results of this study suggest that perceived PCBs by instructors and universities negatively influence underlying indices of student achievement in terms of motivation, engagement, and learning within and across modalities of instruction. Given this and near universal decrements in student enrollment and retention in institutions of higher education, it is important for universities and

instructors to understand, explicitly and transparently negotiate, and meet student expectations to improve student progression to graduation and maintain competitiveness among similar institutions.

KEYWORDS

modalities of instruction, psychological contracts, student learning outcomes, university students

1 | INTRODUCTION

Generally, existing evidence suggests that different modalities of instruction result in comparable student academic outcomes in higher education, including perceived and actual performance, motivation, satisfaction with course delivery, and retention (Bernard et al., 2004; Bernard et al., 2014; Means et al., 2010; Vo et al., 2017; Woldeab et al., 2020; Zhao et al., 2005). This same body of work also makes clear that there is wide variability in primary study effect sizes, making the foregoing conclusion uncertain, and suggests that there are other student, instructor, course, or university variables that might account for that variability. One such variable might be psychological contracts, or breaches thereof, between students, instructors, or universities. Indeed, perceived failures of instructors or institutions to uphold their ends of these bargains have been linked to student and institutional consequences (Crisp et al., 2009; Longden, 2006). Thus, this study examines how unexpected, pandemic-triggered pivots to distance and blended learning impact student perceptions of their learning experiences through the lens of the psychological contract theory.

In the following sections, we start by defining three distinct modalities of instruction (i.e., course delivery) and elaborate on the comparative studies that describe the relative effectiveness of each in terms of student learning outcomes (SLOs). We then discuss psychological contract theory, highlighting research that supports the inverse relationship between perceived student–instructor–university psychological contract breaches and SLOs. Lastly, we integrate the foregoing separate streams of research and test the notion that unexpected changes in course delivery might increase perceptions of student–instructor–university psychological contract breaches and, ultimately, perceived SLOs within and across modalities.

2 | LITERATURE REVIEW

2.1 | Modalities of Instruction

Broadly, there are three distinct types of learning modalities, namely (1) traditional face-to-face (F2F) classroom instruction; (2) distance education; and (3) blended learning (Bernard et al., 2004). Distance education is distinguishable from traditional F2F classroom instruction in the following ways: (1) separation in space of student–teacher and student–classmates; (2) the use of technology; and (3) the provisions of two-way communication (Bernard et al., 2004). Distance education can take place synchronously or asynchronously, though past research suggests that synchronous distance education may be a poor substitute for traditional F2F classroom instruction (Bernard et al., 2004). On the other hand, blended learning incorporates elements of both traditional F2F classroom instruction and distance education and is sometimes considered the “best of both worlds” (Bernard et al., 2014; Todd et al., 2017).

Primary (i.e., independent or single) studies on the comparative effectiveness of the foregoing modalities of instruction are mixed. Thus, the following review is primarily based on meta-analytic studies, specifically defined as systematic consolidations of existing primary study results on a specific phenomenon into overall mean effect sizes, from which conclusions can be drawn (Mullen, 2013). As compared to any one primary study, meta-analytic studies provide better, less biased understandings of the existing science on the relative effectiveness of the three modalities of instruction (Mullen, 2013).

2.2 | Student outcomes

The bulk of the primary studies on modality comparisons in terms of student (e.g., achievement; motivation; satisfaction) and institutional (e.g., retention and dropout rates) outcomes focuses on the differences between distance education and traditional F2F learning, most of which find small to no differences in terms of effect sizes in favor of one over the other (for a sampling of primary study results, see Anderson & May, 2010; Bains et al., 2011; Cavanaugh & Jacquemin, 2015; Filak & Nicolini, 2018; Garratt-Reed et al., 2016; Helms, 2014). Several meta-analytic studies exist that attempt to consolidate these results to paint a clearer picture of the comparative effectiveness of these two learning modalities (Bernard et al., 2004; Means et al., 2010; Woldeab et al., 2020; Zhao et al., 2005). The overall conclusion of these studies suggests that the two modalities produce comparable student and institutional outcomes.

As examples, Bernard et al.'s (2004; 233 studies) and Woldeab et al.'s (2020; 69 studies) meta-analyses of the comparative differences between distance learning and traditional F2F classroom instruction found that the overall effect sizes were essentially zero for indices of student learning, including satisfaction, motivation, achievement, and retention. As briefly mentioned above, the way in which distance education is consumed can differ, the student learning impacts of which were not directly considered in either of the two meta-analytic studies set forth above. Based on Zhao et al.'s (2005; 51 studies) meta-analysis, however, it does appear that, when distance education courses include *both* synchronous and asynchronous elements, they positively influence SLOs (e.g., attitudes, beliefs, and evaluations of learning) significantly more than traditional F2F instruction. Subsequent primary studies conducted before and during the COVID-19 pandemic preliminarily support this “bichronous” approach to distance education (e.g., Martin et al., 2020; Peterson et al., 2018).

Relatively fewer studies have compared the effectiveness of all three modalities of instruction. In 2010, however, the U.S. Department of Education conducted an extensive meta-analysis that included comparative studies ($n = 50$) published between 1996 and 2008, 43 of which relied on college or university samples (Means et al., 2010). The results of this meta-analytic study revealed that the mean effect sizes pitting distance education against (a) traditional F2F instruction and (b) blended learning, in terms of objective and direct measures of student learning, were not significantly different from zero. However, the mean effect size difference between blended and F2F was small, but significant, in favor of the former (for similar meta-analytic results on a broader set of outcomes, see Bernard et al., 2014). This significant difference is reportedly more robust for students pursuing STEM disciplines (see Vo et al., 2017; 30 STEM v. 20 non-STEM disciplines).

The results of the foregoing meta-analytic studies revealed wide variability in primary study effect sizes. Consequently, their authors cautioned that the advantage of one learning modality over another may result from differences in other institution-, course-, or student-specific variables. These potential additional influences on SLOs might reveal why some students do well in courses that offer distance education or blended learning, while others do not.

2.3 | Psychological contracts

A psychological contract is generally defined as the set of implicit and explicit beliefs not formalized by written agreement about the reciprocal obligations between two or more parties (e.g., Rousseau, 1989). These beliefs are

inherently subjective, varying from person to person, even among parties to the same psychological contract (e.g., Bordia et al., 2010), and can take the general forms of transactional and relational expectations. Transactional expectations are generally short in duration, explicitly negotiated, and focused on performance expectations that, when met, are rewarded.

Relational expectations, on the other hand, are longer in duration, less clearly articulated, and generally based on loyalty, stability, commitment, and trust, the fulfillment of which fosters individual satisfaction and well-being (Bordia et al., 2010; Pietersen, 2014; Raja et al., 2004). Both types can be contained in a single psychological contract and are not mutually exclusive in that both transactional and relational contract provisions may interact and influence individual perceptions (Koskina, 2013). The foregoing is supported by the social exchange theory, which posits that the exchange of social, emotional, and material resources is the cornerstone of social relationships and that such exchanges rest on norms of reciprocity (Blau, 1964).

Within institutions of higher education (Dziuban et al., 2015; Knapp & Masterson, 2018; Koskina, 2013; Wade-Benzoni et al., 2006), student psychological contracts are appropriately narrowed to pedagogical relationships. A student's psychological contract is conceptualized as a tripartite relationship among students, instructors, and the university, with the student as the focal party to the contract (Koskina, 2013). Students further view instructors as agents of, and the main student connection to, the university. Not surprisingly then, research suggests that the student–instructor relationship not only drives the development and operation of the psychological contract, but also mediates the effects of the student–university psychological contract on student outcomes (Koskina, 2013).

2.4 | Student expectations

Educational expectations are beliefs that students “bring from their previous experience with similar situations and from their interpretations of cues in the current environments that tell them “what's going on” and what is appropriate behavior” (Hall et al., 2011, p. 2). Student expectations within higher education have been linked with indices of student learning, retention (e.g., Briggs et al., 2012; Pleitz et al., 2015), and satisfaction (Zhang et al., 2008). Thus, the fulfillment of psychological contract expectations, both promissory (explicit) and non-promissory (implicit), are important to achieving successful relationships with students (Koskina, 2013). Within the context of higher education, a psychological contract provision may be considered explicit if the substance thereof was communicated to the student via official conversations, orally or otherwise; on the other hand, such a provision may be considered implicit if it was communicated through classmates or the institution's website or other promotional materials.

Koskina (2013) found that student–university and student–instructor psychological contracts had both promissory (i.e., transactional expectations) and non-promissory (i.e., relational expectations) elements. Pertaining specifically to the student–university relationship, promissory expectations included tangible (e.g., facilities) and intangible (e.g., administrative and academic support) resources, while non-promissory expectations included opportunities to network, develop skills that enhance employability, enjoy new experiences, and join positive learning communities. The student–instructor relationship, on the other hand, is believed to encompass extrinsic (i.e., promissory) and intrinsic (non-promissory) expectations. Extrinsic expectations are the overt promises (e.g., syllabus) regarding academic support, including coursework guidance and feedback, while intrinsic expectations pertain to instructor attributes, such as knowledge, approachability, punctuality, transparency, and trustworthiness. Overall, students do formulate expectations about what they are entitled to or should receive from the university (i.e., facilities; amenities; uphold promises in marketing and recruitment material) and their instructors (i.e., knowledge; feedback) in exchange for what the student offers (i.e., tuition, fees, attendance, effort).

2.5 | Psychological contract breaches

A breach of a psychological contract is a subjective reaction to an actual breach (i.e., renege) of explicit promises or a perceived breach (i.e., incongruence) of provisions that an individual assumed were part of the contract but were not fulfilled (e.g., Bordia et al., 2010). Consequences of psychological contract breaches regarding student and institutional outcomes include lower levels of student well-being and satisfaction with the university and its agents (Bordia et al., 2010), reduced academic performance, and stronger intentions to leave the university (Lowis & Castley, 2008). Whether the psychological contract provisions are between student and teacher or student and the university, fulfillment is related to improved SLOs and stronger satisfaction with educational experiences (Bordia, 2007; Wade-Benzoni et al., 2006).

2.6 | Current study

Studies that compare the effectiveness of two or more learning modalities focus on perceived or actual classroom performance and student perceptions of motivation, learning, and satisfaction. This study's focus is on the latter, examining differences in students' perceptions of motivation to succeed, engagement, and learning, as well as their general preference for one or more of the three distinct modalities. Such perceptions are important as they are linked with objective student academic performance (Bains et al., 2011; Rosenberg et al., 2005) as well as institutional outcomes, such as recruitment, retention, and dropout rates (Bernard et al., 2004; Pleitz et al., 2015). In fact, Bernard et al. (2014) argued that motivation is key to successful student learning across modalities. In support, Kusrkar et al. (2013) reported that motivated students tend to achieve higher academic performance than their less motivated counterparts, due to better study strategies and greater effort. Furthermore, Dziuban et al. (2007) found that motivation and engagement linked student satisfaction to academic achievement, such that satisfied students tended to report higher motivation and engagement than less satisfied students. In turn, higher motivation and engagement predicted better performance. On the other hand, student dissatisfaction with and negative emotional reactions to learning modalities have been linked to reduced retention and increased dropout rates (e.g., Schertzer & Schertzer, 2004). One of the driving forces behind these results might be students' beliefs about the fulfillment or breach of the psychological contracts between them and their university or instructors.

Whether unexpected changes in course delivery (i.e., modality of instruction) influence student perceptions of psychological contract breaches, potentially influencing underlying indices of student achievement, is not yet known. During the Fall of 2020, the COVID-19 pandemic provided a unique opportunity to study these potential relationships because many residential institutions of higher education opted into, or were required to, offer distance and/or blended learning to accommodate COVID-19 safety measures, particularly physical distancing, to protect their student bodies and reduce the spread of the virus.

We drew this study's sample from one of two residential campuses of a small, private STEM university, which, before March 2020, offered course content via F2F instruction only. Before the pandemic, this university distinguished itself from others by focusing on dynamic and personalized F2F interactions with professors in and outside of the classroom and student-driven research and project collaborations with faculty. Such university communications, along with well-established campus norms regarding the presence, approachability, and availability of faculty, set the stage for student expectations that, due to unforeseen circumstances, likely would not be met. In explanation, the campus from which we sampled our participants offered three different modalities of instruction during the Fall 2020 semester: (1) F2F; (2) distance (incorporating both synchronous and asynchronous elements); and (3) blended. University implemented COVID-19 safety precautions mandated restricted class capacities to ensure that each student was at least six feet from any other classmate. Thus, most courses were offered either in F2F or blended learning format depending on the size of the classroom and student

course enrollment. Instructors who were at higher risk of severe reactions to COVID-19 could receive an exemption from teaching on campus, resulting in a number of courses offered via distance education only.

It is important to note that the COVID-19 pandemic was an evolving situation, with many institutions of higher education delaying decisions about content delivery during Fall 2020 until late in the summer. This university was no exception, adopting the different modalities of instruction only weeks before the start of the new academic year. Consequently, many students were not aware of changes to the delivery of their courses until the first week of classes (reasonably or not). While meta-analytic studies on comparisons among modalities of instruction find that there is little to no mean effect differences in terms of student outcomes, there is wide variability among primary study effect sizes to suggest other variables are at play, potentially student-instructor-university psychological contract breaches regarding course and content delivery.

In this case, this university's students were likely expecting traditional F2F classroom experiences based on university communication (or a lack thereof regarding changes to course delivery due to COVID-19 before the academic term) and established campus norms. In consideration of these established norms that students who attend this university readily expect, we believe that all things being equal, students will (1) perceive higher levels of motivation, engagement, and learning in F2F courses than either distance education or blended courses; (2) perceive more breaches on the part of instructors delivering distance education than faculty offering either F2F or blended instruction; and (3) generally prefer F2F instruction over other modalities of instruction. Thus, we propose the following hypotheses:

Hypothesis 1. *Students will report higher levels of motivation to succeed in F2F courses as compared to distance or blended courses.*

Hypothesis 2. *Students will report higher levels of (a) engagement and (b) learning in F2F courses as compared to distance or blended courses.*

Hypothesis 3. *Students will report higher levels of psychological contract breach among faculty who taught distance courses compared to those who taught F2F and blended courses.*

Hypothesis 4. *Students will prefer F2F modality of instruction over distance and blended modalities of instruction.*

We also expect, however, that students will perceive breaches on the part of the (1) university for not upholding explicit promises regarding course delivery and student-faculty interactions in exchange for tuition and fees; and (2) instructors for those and other reasons, such as transparency failures, real or perceived, in exchange for attendance, class contributions, and effort. We also expect that these breaches will influence the extent that students are motivated and engaged in and are learning within each modality of instruction. Specifically, we expect perceived breaches on the part of the university to negatively impact student outcomes across modalities, the effects of which will be mediated by perceived breaches of the student-instructor relationship. Conversely, we expect perceived breaches on the part of instructors to negatively impact student outcomes within modalities. For example, if students perceive that F2F instructors failed to uphold explicit or implicit promises that students believe that they are entitled to or should receive, then student outcomes within those courses will be poorer as compared to blended and distance learning. Thus, we propose the following hypotheses:

Hypothesis 5. *Perceived psychological contract breach by the university is negatively related to (a) motivation to succeed across modalities of instruction; (b) engagement across modalities of instruction; and (c) learning across modalities of instruction. The foregoing relationships are (d) mediated by perceived psychological contract breach by faculty who teach distance, and/or blended courses, as appropriate.*

Hypothesis 6. *Perceived psychological contract breach by faculty who teach F2F courses is negatively related to (a) motivation to succeed in F2F courses, and positively related to (b) more engagement in distance and blended courses than F2F courses; (c) more learning in distance and blended courses than F2F; and (d) a general preference for distance and blended courses over F2F courses.*

Hypothesis 7. *Perceived psychological contract breach by faculty who teach distance courses is negatively related to (a) motivation to succeed in distance courses, and positively related to (b) more engagement in F2F and blended courses than distance courses; (c) more learning in F2F and blended courses than distance courses; and (d) a general preference for F2F and blended courses over distance courses.*

Hypothesis 8. *Perceived psychological contract breach by faculty who teach blended courses is negatively related to (a) motivation to succeed in blended courses, and positively related to (b) more engagement in F2F and distance courses compared to blended courses; (c) more learning in F2F and distance courses than blended courses; and (d) a general preference for F2F and distance courses over blended courses.*

3 | METHOD

3.1 | Procedures

To recruit participants for this study, the second author employed both convenience and snowball sampling strategies to cast a wider net over the student body across campus and colleges. First, an invitation to participate was sent to students with a university-issued email address. The email invite contained the online Google Forms' survey link. Because people are more likely to open an email from someone they know (Joinson & Reips, 2007), the email invite also requested recipients to forward the email to other students who may be eligible to participate in the study. Students who met our eligibility requirements were at least 18 years of age and attended the small, private university's residential campus. The first page of the online survey contained the informed consent, the contents (e.g., voluntariness; methodology; anonymity of the data) of which were approved by the authors' institutional review board.

3.2 | Participants

This study's participants were a sample of undergraduate students who attended one of the residential campuses of a small, private STEM university located in the western part of the United States. During the Fall of 2020, this campus offered distance education, F2F, and blended courses, as appropriate, to protect faculty at higher risk of severe reactions to COVID-19 and to comply with COVID-19 safety precautions. At the time of data collection, the campus was comprised of 2931 students, distributed across four academic colleges: College of Engineering (COE, 1156 students, 39.44%); College of Aviation (COA, 952 students, 32.48%), College of Arts and Sciences (CAS, 393 students, 13.40%), and College of Security and Intelligence (CSI, 430 students, 14.67%).

This study was comprised of 155 undergraduates or 5.3% of the total student body. The exact response rate cannot be computed as it is unknown how many emails were received (Wright, 2015). While 5.3% of the student body might seem too small of a sample to produce generalizable results, a growing body of literature indicates that low response rates are poor predictors of nonresponse bias. In fact, Fosnacht et al. (2017) found that response rates as low as 5% produced reliable population (i.e., college students) estimates as the number of respondents equaled 50 or more. Based thereon, they recommended shifting focus from response rates to sample sizes in research on college students. Furthermore, Wright (2015) showed that surveying homogenous groups reduce the chances that

those who do not respond are systematically different (e.g., demographically, culturally, or by age) than those who do. As more thoroughly described below, this campus attracts traditional college students, all of whom are pursuing STEM disciplines (e.g., data analytics, human factors, mechanical engineering), reducing the likelihood of nonresponse bias.

Nevertheless, we analyzed the degree that this study's sample might generalize to the campus' student population. First, we computed the number and proportion of participants within each college: COE (82, 52.9%), COA (17, 11%), CAS, (24, 15.5%), CSI (32, 20.6%). Then, we compared the proportion of participants within each college to that of the student body (set forth above). This comparison revealed that the distribution of participants across the four colleges approximates the proportion of the total student population within each college, except for the COA. Due to this anomaly, we tested our hypotheses on the data with and without the COA participants—the pattern of results was the same. Thus, all of this study's data were used for analysis purposes.

This study's participants identified as male ($n = 86$), female ($n = 67$), agender ($n = 1$), and nonbinary ($n = 1$). Of the 155 undergraduates, the average age was 20.08 ($SD = 1.18$), with nine freshmen, 52 sophomores, 63 juniors, 28 seniors, and three super (i.e., have attended the university for more than 4 years) seniors. More female students responded to the online survey than was expected based on the gender distribution on this campus (73% male; 27% female). Research has consistently reported unequal survey participation by gender (Smith, 2008). In fact, gender has been shown as the best predictor of survey completion, with females more likely to respond than males (Sax et al., 2003). Perhaps more importantly, gender was not significantly correlated with any of this study's focal variables (see Table 1), minimizing the likelihood that disproportionate responding by females impacted the results of this study.

3.3 | Measures

All participants were asked to complete a multi-item online survey as follows and as more thoroughly described in the subsections below. First, participants reported their age, gender, and year of matriculation (i.e., freshman, sophomore, junior, senior, super senior). Second, participants indicated the extent to which they were motivated to succeed, engaged, and learning within each modality of instruction, and preferred one modality over another. Each of the foregoing SLOs was assessed by one or more adapted (i.e., to accommodate all three modalities of instruction) items that comprise the Engaged Learning subscale of Dziuban et al.'s (2015) Student Satisfaction with Online Learning (SSOL) instrument. Reliability, item validity, and construct validity of the Engaged Learning subscale has been established by Dziuban et al. (2015), as the original SSOL developers, as well as Kumalasari and Akmal (2021). Finally, student perceived psychological contract breaches were assessed via an adapted (i.e., to apply to universities and professors rather than employers) instrument originally developed by Robinson and Morrison (2000), who also established its reliability and validity in a longitudinal study. All items pertaining to the foregoing instruments had six response options ranged from 1 (*strongly disagree*) to 6 (*strongly agree*).

3.3.1 | Motivation to succeed, engagement, and learning by modality of instruction

First, to assess each student's overall motivation to succeed in each available modality of instruction, the following adapted item developed by Dziuban et al. (2015) was used: "Generally, I am motivated to work at my highest level in my [F2F/distance education/blended] courses this semester." Second, to compare participants' overall engagement in each available modality of instruction, the following adapted item originally developed by Dziuban et al. (2015) was used: "Generally, I am more engaged in my [F2F/distance education/blended] classes than in my [F2F/distance education/blended] classes this semester." These comparisons resulted in three distinct items: (1) engaged more in F2F courses than distance education courses; (2) engaged more in distance education courses than blended

TABLE 1 Correlations among, descriptive statistics and interrater reliability estimates for this study's variables

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Age of Student	20.08	1.18	-																		
2. Gender of Student	-	-	.02	-																	
3. Personal Impact of COVID-19	3.54	0.84	.14	.06	-																
4. PCB - University	4.56	0.09	.19*	-.11	.31** (.85)																
5. PCB - F2F Professors	2.50	1.40	.02	.07	.14	.22*	-														
6. PCB - DE Professors	3.63	1.69	-.11	-.18	.34**	.30**	-.22	-													
7. PCB - BL Professors	3.19	1.43	.13	-.05	.41**	.34**	.24*	.32**	-												
8. Motivated to Succeed in F2F	4.67	1.30	-.18	.01	.00	-.07	-.42**	.30*	.03	-											
9. Motivated to Succeed in DE	2.29	1.47	-.01	.06	-.27*	-.32**	-.05	-.41**	-.23*	-.19	-										
10. Motivated to Succeed in BL	3.12	1.54	-.12	.03	-.22**	-.34**	.04	-.36**	-.44**	-.06	.41**	-									
11. Engaged More in DE than BL	2.12	1.44	.18	.05	-.07	.02	.15	-.46**	-.05	-.16	.33**	.07	-								
12. Engaged More in F2F than DE	5.07	1.35	-.04	.09	.27**	.10	-.21*	.55**	.36**	.27**	-.50**	-.35**	-.51**	-							
13. Engaged More in BL than F2F	2.25	1.33	-.05	-.05	-.22*	-.06	.12	-.42**	-.36**	-.29*	.43**	.51**	.27*	-.49**	-						
14. Learning More in DE than BL	2.23	1.42	.09	.14	-.18	.04	.24	-.44**	.02	-.30*	.35**	.04	.67**	-.53**	.29*	-					

(Continues)

TABLE 1 (Continued)

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
15. Learning More in F2F than DE	5.06	1.25	.04	.10	.29**	.15	-.20*	.50**	.34**	.39**	-.40**	-.41**	-.36**	.80**	-.60**	-.40**	-	-	-	-	-
16. Learning More in BL than F2F	2.11	1.27	.01	.06	-.19*	-.07	.22*	-.40**	-.45**	-.34**	.14	.49**	.21	-.49**	.62**	.15	-.55**	-	-	-	-
17. Generally Prefers F2F over DE	4.99	1.20	-.05	.04	.26**	.14	-.25*	.55**	.34**	.44**	-.45**	-.38**	-.44**	.86**	-.60**	-.53**	.92**	-.62**	(.92)		
18. Generally Prefers DE over BL	2.33	1.30	.13	.13	-0.19	-0.03	.24	-.50**	-0.06	-.25*	.39**	.06	.83**	-.61**	.27	.93**	-.47**	.22	-.57**	(.92)	
19. Generally Prefers BL over F2F	2.29	1.11	-.04	.10	-.24**	-.09	.20*	-.46**	-.48**	-.37**	.28*	.54**	.27*	-.51**	.79**	.25*	-.57**	.92**	-.64**	.28*	(.93)

Note: Interitem reliability estimates along the diagonal. Gender = Male(0); Female(1).

Abbreviations: BL, blended learning; DE, distance education; F2F, face-to-face instruction; PCB, psychological contract breach.

*Correlation is significant at the .05 level (two-tailed).

**Correlation is significant at the .01 level (two-tailed).

courses; and (3) engaged more in blended courses than F2F courses). Finally, we used the following adapted item originally developed by Dziuban et al. (2015) to compare students' overall learning in each available modality of instruction: "Generally, I am learning more in my [F2F/distance education/blended] courses than in my [F2F/distance education/blended] courses this semester." These comparisons resulted in three distinct items: (1) learning more in F2F courses than distance education courses; (2) learning more in distance education courses than blended courses; and (3) learning more in blended courses than F2F courses.

3.3.2 | Modality of instruction preference

To measure general preference of one modality of instruction over another, we used adapted items developed by Dziuban et al. (2015), which included two of the immediately preceding items (i.e., Engagement and Learning by Modality of Instruction) plus four additional items: (1) "Generally, I am understanding course material better in my [F2F/distance education/blended] classes than in my [F2F/distance education/blended] classes this semester"; (2) "Generally, I am understanding course requirements better in my [F2F/distance education/blended] courses than in my [F2F/distance education/blended] courses this semester"; (3) "Generally, assessments of my academic progress are more accurate in my [F2F/distance education/blended] courses than in my [F2F/distance education/blended] courses this semester"; and (4) "Generally, I've had more opportunities to collaborate with other students in my [F2F/distance education/blended] courses than in my [F2F/distance education/blended] courses this semester." These preference comparisons resulted in three separate scales: (1) generally prefers F2F over distance education instruction; (2) generally prefers distance learning over blended instruction; and (3) generally prefers blended over F2F instruction.

3.3.3 | Psychological contract breach—university and professors by modality

To assess the degree to which students perceived that their psychological contract was breached by the university, we used the following adapted five-item scale originally developed by Robinson and Morrison (2000). Example items include: "I have not received everything promised to me by the university in exchange for tuition during the Fall 2020 semester" and "I feel that the university has come through in fulfilling its promises made to me during the Fall 2020 semester (reverse coded)." To assess the degree to which students perceived that their psychological contracts were breached by their F2F, distance education, or blended course instructors, we asked the following question adapted from Robinson and Morrison (2000): "Generally, the professors who teach my classes that offer [F2F/distance education/blended] instruction have done an excellent job of fulfilling their promises to me this semester."

3.4 | Additional questions—awareness of changes to modality of instruction

To understand the extent that students were aware of changes to course content delivery for the Fall 2020 semester, we asked the following questions "Before the start of the school year, did you believe that all classes offered at the university would be delivered face-to-face (F2F) during the Fall 2020 semester?" "Before the start of the school year, did the university communicate to students that it was offering face-to-face (F2F) instruction during the Fall 2020 semester?" and "To the best of your recollection, when did your professors notify you that course delivery would be different than you expected? NOTE: provide as many answers as you have professors."

4 | RESULTS

4.1 | Descriptive statistics and student awareness of course delivery

Correlations among, descriptive statistics, and inter-item reliability estimates for this study's variables are set forth in Table 1. As to student awareness of changes to content delivery, just over 43% of the student respondents reported that they believed course content would be delivered F2F before the start of the new academic year and just over 48% recalled that university communication during the summer supported this belief. Other respondents expressed confusion as to which, and to what degree, different modalities of instruction would be offered during the Fall 2020 semester. While the timing of instructor communication to students regarding changes in expected course content delivery was mixed, the large majority of students reported that most instructors informed them of such changes one to two weeks before the academic term, with many learning this information during the first day of classes.

4.2 | Hypotheses testing

To test Hypothesis 1, we compared the means across modalities for motivation to succeed via a one-sample *t* test. Hypothesis 1 was supported by the data. As detailed in Table 2, the mean for F2F instruction was significantly higher than the means for both distance education and blended instruction for motivation to succeed. It is worth noting that the mean for blended instruction was significantly higher than distance education for the same variable (see Table 2).

To test Hypothesis 2, we computed and then compared the means across modalities for engagement and learning. Analyzing the means via a one-sample *t* test was inappropriate in this instance as the items are comparative in nature. For example, the engagement items were in the following format: "Generally, I am more engaged in my [F2F/distance education/blended] classes than in my [F2F/distance education/blended] classes this semester." The learning items were similarly structured. Instead, we isolated the items that pertained to a specific learning modality (e.g., F2F), then evaluated whether that learning modality was rated higher or lower than the learning modality to which it was directly compared (e.g., distance education or blended). As detailed in Table 2, the means supported Hypothesis 2 that students would report higher levels of engagement and learning in F2F courses as compared to distance or blended courses. While not specifically hypothesized, the means for blended instruction exceeded those of distance education for the same variables (see Table 2).

To test Hypothesis 3, we employed a one-sample *t* test to compare the means across modalities on perceived psychological contract breach among faculty who taught distance education courses compared to those who taught F2F and blended courses. As detailed in Table 2, Hypothesis 3 was supported by the data in that the mean of instructor psychological contract breach for distance education courses was significantly higher than those of F2F and blended courses. While not specifically hypothesized, the mean of instructor psychological contract breach for blended courses was significantly higher than for F2F courses (see Table 2).

To test Hypothesis 4, we compared the means of preference for F2F modality of instruction compared to those of distance education and blended modalities of instruction. We did not do so via a one-sample *t* test as the items are comparative in nature. For example, one item was formatted as follows: "Generally, I am understanding course material better in my [F2F/distance education/blended] classes than in my [F2F/distance education/blended] classes this semester." All remaining instrument items were similarly formatted. The mean of preference for F2F instruction was higher than those of distance education and blended instruction, in full support of Hypothesis 4. Of note, the mean of preference for blended instruction exceeded that of distance education (see Table 2).

As shown in Table 1, perceived psychological contract breach by the university was significantly related to lower levels of motivation to succeed in distance education ($r = -.32, p < .01$) and blended ($r = -.34, p < .01$), but not

TABLE 2 Sample sizes, means, and standard deviations of student outcomes based on modality and one-sample *t* test results for direct modality comparisons on motivated to succeed and PCB

	n	Mean	SD	t	95% CI	
					Lower	Upper
Motivated to succeed in F2F	105	4.67 ^a	1.31	36.62**	4.41	4.92
Motivated to succeed in DE	87	2.29 ^b	1.47	14.51**	1.97	2.60
Motivated to succeed in BL	149	3.12 ^c	1.54	24.71**	2.87	3.37
PCB by F2F instructors	105	2.50 ^a	1.40	18.32**	2.23	2.78
PCB by DE instructors	87	3.63 ^b	1.69	20.02**	3.27	3.99
PCB by BL instructors	149	3.19 ^c	1.44	27.15**	2.96	3.43
Engaged more in DE than BL	84	2.12	1.44	-	-	-
Engaged more in F2F than DE	99	5.07	1.35	-	-	-
Engaged more in BL than F2F	87	2.25	1.33	-	-	-
Learning more in DE than BL	84	2.23	1.42	-	-	-
Learning more in F2F than DE	99	5.06	1.25	-	-	-
Learning more in BL than F2F	119	2.11	1.27	-	-	-
Preference for DE over BL	84	2.33	1.30	-	-	-
Preference for F2F over online	99	4.99	1.20	-	-	-
Preference for BL over F2F	119	2.29	1.11	-	-	-

Note: All variables were assessed on a Likert-type scale from (1) *strongly disagree* to (6) *strongly agree*.

Abbreviations: 95% CI, 95% confidence interval of the mean difference; means bearing the same alphabetical subscript do not differ from each other; BL, blended learning; DE, distance education; F2F, face-to-face instruction; PCB, psychological contract breach.

F2F ($r = .07, p > .05$), courses, in partial support of Hypothesis 5(a). As shown in Table 1, neither of Hypothesis 5(b) nor 5(c) was supported by the data in that breach by the university was not significantly related to engagement or learning within any of the modalities of instruction.

As proposed in Hypothesis 5d, we performed two simple mediations using the Process macro (Hayes, 2017) in SPSS to test whether the immediately foregoing significant relationships were mediated by perceived psychological contract breach by faculty who teach distance education or blended courses, as appropriate. To compute confidence intervals (CI) for indirect effects, we used 5000 bootstrapped samples from the original data (Hayes, 2017).

In the first analysis, we entered in “motivation to succeed in distance education courses” as the dependent variable. The predictor variable for this analysis was “perceived psychological contract breach by the university,” while the mediator variable was “perceived psychological contract breach by faculty who taught distance education courses.” Both the direct effect of the predictor variable on the dependent variable and the indirect effect between the two via the mediator were significant (direct effect = $-.3214, p = .04, 95\% \text{ CI } [-.6227, -.0202]$; indirect effect = $-.1545, 95\% \text{ CI } [-.2977, -.0316]$), suggesting partial mediation.

In the second analysis, we entered in “motivation to succeed in blended courses” as the dependent variable. The predictor variable for this analysis was “perceived psychological contract breach by the university,” while the mediator variable was “perceived psychological contract breach by faculty who taught blended courses.” Both the direct effect of the predictor variable on the dependent variable and the indirect effect between the two via the

mediator were significant (direct effect = $-.3278$, $p = .01$, 95% CI [$-.5641$, $-.0915$]; indirect effect = $-.1954$, 95% CI [$-.3218$, $-.0875$]), suggesting partial mediation. As such, Hypothesis 5(d) was partially supported by the data.

As shown in Table 1, Hypothesis 6(a) was supported by the data. Perceived psychological contract breach by faculty who teach F2F courses was negatively related to motivation to succeed in F2F courses ($r = -.42$, $p < .01$). Hypothesis 6(b) was partially supported. In explanation, perceived psychological contract breach by F2F faculty was significantly and positively related to higher engagement in distance education ($r = .21$, $p < .05$), but not blended ($r = .12$, $p > .05$), courses as compared to F2F courses. Perceived psychological contract breach by F2F faculty was significantly and positively related to more learning in both distance education ($r = .20$, $p < .05$) and blended ($r = .22$, $p < .05$) courses as compared to F2F courses, in full support of Hypothesis 6(c). Finally, Hypothesis 6(d) also was fully supported by the data in that perceived psychological contract breach by F2F faculty was positively related to a greater preference for distance education ($r = .25$, $p < .05$) and blended ($r = .20$, $p < .05$) courses over F2F courses.

As shown in Table 1, Hypothesis 7 was fully supported by the data. Perceived psychological contract breach by faculty who teach distance education courses was negatively related to motivation to succeed in distance education courses ($r = -.41$, $p < .01$), and related to less engagement and less learning in distance education courses as compared to F2F ($r = -.55$, $p < .01$; $r = -.50$, $p < .01$, respectively) or blended ($r = -.46$, $p < .01$; $r = -.44$, $p < .01$, respectively) courses. Finally, perceived psychological contract breach by distance education faculty was positively related to a greater preference for F2F ($r = .55$, $p < .01$) and blended ($r = .50$, $p < .01$) courses over distance education courses.

As shown in Table 1, Hypothesis 8(a) was supported by the data. Perceived psychological contract breach by faculty who teach blended courses was negatively related to motivation to succeed in blended courses ($r = -.44$, $p < .01$). Hypothesis 8(b)–(d), however, was only partially supported. In explanation, perceived psychological contract breach by blended faculty was significantly and positively related to higher engagement in F2F ($r = .36$, $p < .01$), but not distance education ($r = -.05$, $p > .05$), courses as compared to blended courses. Perceived psychological contract breach by blended faculty was significantly and positively related to more learning in F2F ($r = .45$, $p < .01$), but not distance education ($r = .02$, $p > .05$), courses as compared to blended courses. Finally, perceived psychological contract breach by blended faculty was positively related to a greater preference for F2F ($r = .48$, $p < .01$), but not distance education ($r = -.06$, $p > .05$), courses over blended courses.

5 | DISCUSSION

Existing scholarship reveals that students' perceptions of their educational experiences impact student- and university-level outcomes (e.g., academic motivation, performance, retention rates), making it important that universities understand, manage, and meet student expectations of them and their agents, particularly instructors. As a result of the COVID-19 outbreak and resultant safety mandates, many residential institutions of higher education made changes to the ways in which they normally deliver course content, opting into, for example, distance education and/or blended learning (Dias et al., 2020). These changes provided an opportunity to study how unexpected changes in modality of instruction may lead to student perceived psychological contract breaches and ultimately poorer student outcomes. Therefore, this study examined the extent to which unexpected pivots to distant and blended learning impact student perceptions of their educational experiences through the lens of the psychological contract theory. We did so by sampling from one of two residential campuses of a small, private STEM university, which, before the COVID-19 outbreak, offered F2F instruction exclusively.

Existing meta-analytic studies suggest that SLOs are comparable across modalities of instruction, though there is quite a bit of variability among primary study effects (Bernard et al., 2004; Bernard et al., 2014; Means et al., 2010; Woldeab et al., 2020; Zhao et al., 2005). Our results reveal interesting and consistent trends, indicating that psychological contracts, or breaches thereof, do play a part in determining whether students may prefer and be more motivated and engaged in one modality of instruction over another. First, without exception, students

generally preferred and endorsed traditional F2F classroom instruction as superior to distance education and blended learning in terms of motivation to succeed, engagement, and learning. Students also perceived less psychological contract breaches on the part of faculty who taught F2F than faculty who taught either of the other two modalities.

Second, perceived psychological contract breaches on the part of instructors who taught via a specific learning modality (F2F, distance, or blended) were related to (1) generally preferring the other two modalities over that modality; and (2) lower levels of motivation, engagement, and learning within that modality as compared to the other two. There were two exceptions to this general trend. Direct comparisons revealed that (1) engagement levels were comparable in F2F and blended courses when students perceived higher breaches by faculty who taught F2F courses; and (2) engagement, learning, and general preference levels were comparable in blended and F2F courses when students perceived higher breaches by faculty who taught blended courses. The suggestion here is that F2F and blended learning modalities are more similar to each other than either is to the distance education modality. That is, students received F2F contact with faculty as expected, though to a lesser degree in blended courses. It is possible, then, that regardless of the perceived psychological contract breaches on the part of faculty who teach F2F or blended courses, students still prefer and are more likely to positively receive those modalities over pure distance learning. This may be context specific; that is, our study sample was drawn from a university that, before COVID-19, offered only F2F content delivery. In this way, students who chose to attend this university may consider F2F or courses that offer components of F2F superior to distance learning, regardless of the situation, instructor attributes, or perceived breaches. Thus, results might differ if the sample consisted of students who, before COVID-19, attended universities that provided more options in terms of course content delivery as the norm. For example, Vo et al. (2017) reported that blended learning had small but more beneficial impacts on SLOs than traditional F2F instruction for those pursuing STEM disciplines than those who are not. This may be explained, in part, due to the availability of more diverse course delivery options to Vo et al.'s (2017) sample as compared to ours before the pandemic.

Third, perceived university psychological contract breaches reduced student motivation to succeed in distance and blended, but not F2F, courses both directly and indirectly through perceived psychological contract breaches by faculty who taught distance and blended courses, respectively. None of the other student outcomes (i.e., engagement, learning, or preference) were influenced by perceived university breaches. These results seem to suggest that when courses were offered in the expected format (i.e., F2F), then any unmet expectations were attributed to the instructor. But in those courses that were offered in alternative formats (i.e., distance or blended), then blame was shared by the university and instructors of record. Regardless of who shouldered the blame of those unmet expectations, however, student outcomes were comparable; that is, students' motivation to succeed in their courses was adversely impacted in all three modalities of instruction.

5.1 | Implications

As reported above, student perceived breaches of their psychological contracts by the university and instructors have detrimental effects on their levels of motivation, engagement, and learning across modalities of instruction. Negative student perceptions are important as they have been shown to reduce retention and increase dropout rates, two important university outcomes that speak directly to their survival and competitiveness against other institutions of higher education. Considering the results of this study and near universal student enrollment decreases (Sedmak, 2020), universities have a stake in understanding what students expect from the university and its instructors in exchange for their tuition, fees, and continued commitment to the university.

The results of this study suggest that universities and instructors should invest the effort to understand what their student body expects from them on a regular basis. As Dias et al. (2020) explain, there is room for universities to explicitly offer and instructors to acquire new pedagogical skillsets (e.g., digital acumen) to effectively implement new learning platforms to enhance learning environments and manage student expectations. Based on the extant

literature, such expectations are developed through university-sanctioned communications and materials as well as established campus norms regarding, for example, accessibility to and interactions with faculty members and course content delivery methods. When universities anticipate changes that may impact student expectations, transparency is key to manage those expectations and potentially negotiate anew. In a sample of senior undergraduate students, for example, Pietersen (2014) found that it is possible to renegotiate psychological contracts at critical junctures (e.g., beginning of the academic term via syllabus explication) with students by purposefully and explicitly clarifying course content, including delivery and the reasons, therefore, as well as expectations of both students and instructor.

In line with previous work (Koskina, 2013), it appears that the burden of successfully meeting, managing, and negotiating student expectations may land squarely on faculty shoulders. Our results suggest that regardless of actual or perceived university breaches, students perceive those effects through their instructors, as agents of, and their direct connections to, the university. Thus, top-down communication to stakeholders, particularly instructors and students, must be transparent and timely. This suggestion was echoed by student responses to our additional survey questions. Many students were unaware of the changes in course delivery, despite having to pivot to distance education in the Spring 2020 semester, due to a lack of effective communication (real or perceived) from the university and its instructors.

5.2 | Limitations and future directions

While this study has many strengths, it is not without limitations. First, our sample was drawn from a specific group of students who chose to attend a campus that offered only F2F course content delivery and accessibility to faculty both in and outside of class. Thus, the results of this study may not generalize to other student populations at larger institutions, with more diverse choices of learning modalities (see Vo et al., 2017). Second, faculty were grouped by modality to assess student–faculty psychological contract breaches. Breach perceptions may be contingent on the attributes of individual faculty within modality, possibly obscuring results based on pedagogical approaches, content knowledge, accessibility, and approachability, among other instructor-specific variables. Future research would benefit by exploring these possibilities.

Third, this study was cross-sectional in design, prohibiting causal inferences and reducing the ability to rule out other unknown explanatory variables. For example, it may be that existing negative student attitudes regarding distance and blended learning may have led to psychological breach perceptions, rather than vice versa. In that same vein, it is also possible that, over time, students adapt their expectations to better match their realities, reducing breach perceptions and their negative impacts on student outcomes. Future work should focus on longitudinal, quasi-experimental, and experimental research designs to validate these results in more diverse student samples, tease out temporal sequences of variables, and identify potential causal factors.

Finally, the pandemic-triggered pivots from F2F instruction to distance education ushered in new and emerging technological advances, such as the use of video conferencing technologies (e.g., Zoom, Microsoft Teams, etc.) and other information and communication innovations, to facilitate student engagement and learning (Chaturvedi et al., 2021; Fabriz et al., 2021). With the help of these technological tools, course content was delivered synchronously, asynchronously, and bichronously (i.e., blended) to varying degrees of success based on the digital readiness of instructors (Dias et al., 2020; Fabriz et al., 2021). While delivery approaches to distance education grew in reaction to an emergent situation, it is likely that they will be increasingly integrated into learning platforms going forward (Dias et al., 2020). This study did not examine how different delivery approaches to distance education might impact SLOs. Consequently, ongoing and future research should critically examine the elements of asynchronous, synchronous, and bichronous delivery approaches to (1) identify those elements that enhanced, rather than detracted from, student learning; and (2) explore whether those effects are contingent on instructor, student, or content-related factors.

6 | CONCLUSION

The results of this study suggest that psychological contracts, or breaches thereof, by universities and their instructors negatively influence underlying indices of student achievement in terms of motivation, engagement, and learning, all of which are related to objective student- and university-level outcomes, including academic performance and retention. Given this and near universal decrements in student enrollment in institutions of higher education, it is important for universities and instructors alike to understand, explicitly and transparently negotiate, and meet student expectations, to the extent feasible, to improve student progression to graduation and maintain competitiveness among similar institutions.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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How to cite this article: Gazica, M. W., Leto, G. D., & Irish, A. L. (2022). The effects of unexpected changes to content delivery on student learning outcomes: A psychological contract perspective during the COVID-19 era. *Psychology in the Schools*, 59, 1473–1491. <https://doi.org/10.1002/pits.22685>